Community Partner:

sparc

Produced by:
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Summer 2010

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CURA
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Westland Commons Development

Vision & Design Guidelines for a Sustainable Development

St. Paul's North End

May 2010

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Sparc has owned and maintained the 3-acre Westland Commons property at Western & Maryland in St. Paul for several years now, during which time multiple designs have been proposed, community input was sought, a CURA research project examined possibilities for "ecovillage"-like development, and a student/professional design charrette was held. This fall, Sparc will be at the point of seeking development partners to move ahead with the project. Sparc commissioned this report to **bring their goals for the site together into a document and site plan that could communicate visually and specifically with potential development partners as well as study the feasibility of development proposals**. The site plans contained within this document should not be confused with site plans produced by design firms for implementation which are based on discussion with actual clients. Rather, these plans are exploratory in nature and make assumptions about the needs of future clients. Once development partners are selected and needs assessed, a thorough site planning process should occur.

Executive Summary

The purpose of this document is to serve as a communication tool with which to approach development partners, arming Sparc with specific goals and ideas for development. The beginning of this document distills previous research, design proposals, and background information for the Westland Commons site, including new research into zoning codes and site information. Then, after laying out the overall vision for the site, three site plan options are explored. The site plans examine placement of buildings and program on the site as well as building massing for sunlight , views, and minimization of the building's appearance from the street. The document includes approximate square footages for programs. See following page for summary.

Footprint	(35.0%)	School	123,000 ft²	Senior Housing Only (30 units)		3-Story School with Senior Housing above
Total Footprint	45000 ft²	Housing	26,000 ft²	1 Bed	15 @ 600 ft²	Includes:
School	45000 ft²	Total	149,000 ft²	1 Bed + Den	10 @ 800 ft²	gym & exercise facilities
Housing	(above)	Parking (above)	17 & 20	2 Bed	5 @ 1000 ft²	multiple performance & rehearsal spaces
Large-scale Ag	35000 ft²	Parking (below)	68 - 85			24 classrooms (25 students each = 600)
		Total Parking	105-122			

Option A

Footprint	(35.0%)	Institution	27,400 ft²	Senior Housing (69 units)		First floor offices/community center
Total Footprint	45,000 ft²	Senior Housing	66,900 ft²	1 Bed	36 @ 600 ft²	3 Stories Senior Housing above
School	27,400 ft²	Multiplex Housing	56,000 ft²	2 Bed	30 @ 750 ft²	4 Multiplex units
Housing	17,600 ft²	Total Square Feet	150,300 ft²	3 Bed	3 @ 1000 ft²	Includes:
Large-scale Ag	25,000 ft²	Parking (above)	15	Multiplex Housing (56 units)		daycare for 125 children
		Parking (below)	60	1 Bed	16 @ 500 ft²	office spaces, conference room, classroom
		Parking (multi-plex)	40	2 Bed	24 @ 1000 ft²	fitness center
		Total Parking	115	3 Bed	16 @ 1500 ft²	event space

Option B

Footprint	(35.0%)	School	55,600 ft²	Senior Housing (44 units)		2-Story School for 300 students
Total Footprint	45,000 ft²	Senior Housing	43,200 ft²	1 Bed	20 @ 600 ft²	2-Story Senior Housing above
School	32,000 ft²	Multiplex Housing	24,000 ft²	1 Bed + Den	10 @ 720 ft²	3 Multiplex units
Housing	13,200 ft²	Total Square Feet	149,000 ft²	2 Bed	14 @ 900 ft²	Includes:
Large-scale Ag	32,000 ft²	Parking (above)	17	Multiplex Housing (36 units)		science labs & full kitchen
		Parking (below)	68 - 85	1 Bed	12 @ 500 ft²	performance & rehearsal spaces
		Parking (multi-plex)	30	2 Bed	12 @ 1000 ft²	12 classrooms (25 students each = 600)
		Total Parking	115-132	3 Bed	12 @ 1500 ft²	

Option C

Site Plan Summaries


Willow Reserve
Marydale Park
Maryland Ave W.
Como Ave
Dale St. N
Western Ave
Rice St.
Jackson St.
Front Ave
St. Paul
1 MILE
0'
1320'
2640'
3960'
5280'
Scale in Feet

Location

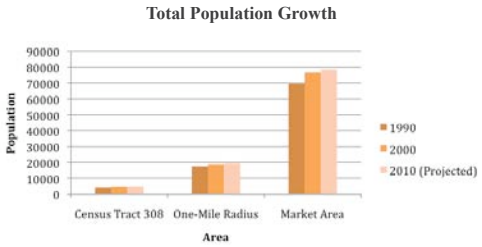
Photo Context

Distances

Walkable Distances

Data Boundaries

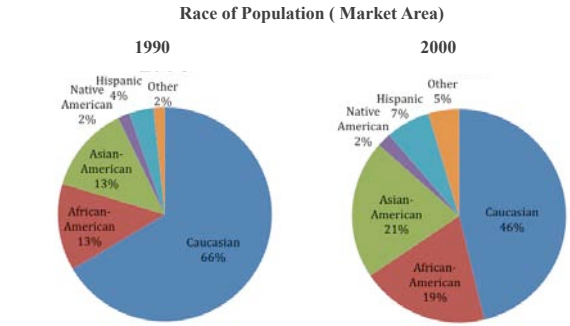
Population Growth



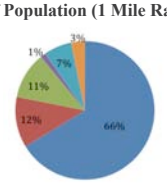
Despite a trend over the last half-century of population flight to the suburbs, all of the area demarcations show a consistent growth in population. It is important to note that the 2010 projections were made prior to the financial crisis.

From 1990 to 2000 all the demarcation areas experienced a growth in employment similar to population growth. However, with the recession and financial crisis, it is prudent to assume growth has stopped or even reversed for the area.

Race



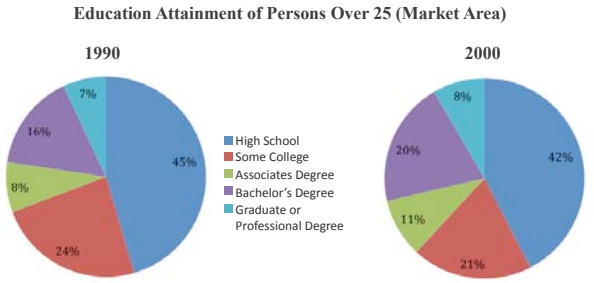
The changes between the graphs from 1990 to 2000 show a dramatic increase in diversity of the market area. In the decade of the 90's all the race groups experienced a sizable increase in population size as well as becoming a larger percentage of the population except for Caucasians who saw a decline in total numbers as well as a sharp decrease in percentage of the population. However, as indicated below, the residents who live within one mile of the Willow Reserve site show a racial composition similar to the market area in 1990.



Age Distribution

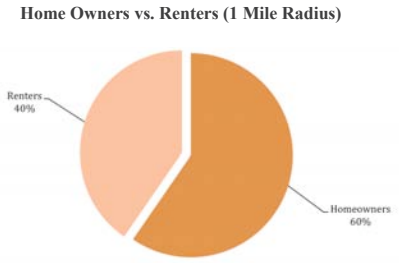
The age distribution shows a pretty traditional downward sloping curve for a population. The most interesting trend displayed in the information is the aging of the baby boomers. For the 45-54 age group there is a spike in group size between the 1990 and 2000 statistics, showing the baby boomers moving into this age range. Then there is a spike in population, although not as large, between 2000 and the projected 2009 statistics. This again shows the movement of the baby boomer population bubble through the age groups.

Education



Not only has the population become more diverse, but also more educated. Marked gains are seen in all categories of higher education graduation. The increase in level of education for the area is also noted in the increase in median income which in 2004 was **$34,595**. Although this is lower than the metro median, so is the percentage of college graduates.

Housing



As stated above, the area is a mix of owner-occupied residences and renter-occupied residences. The majority of rented properties in the area are apartments and have fairly consistent monthly rents (Displayed below).

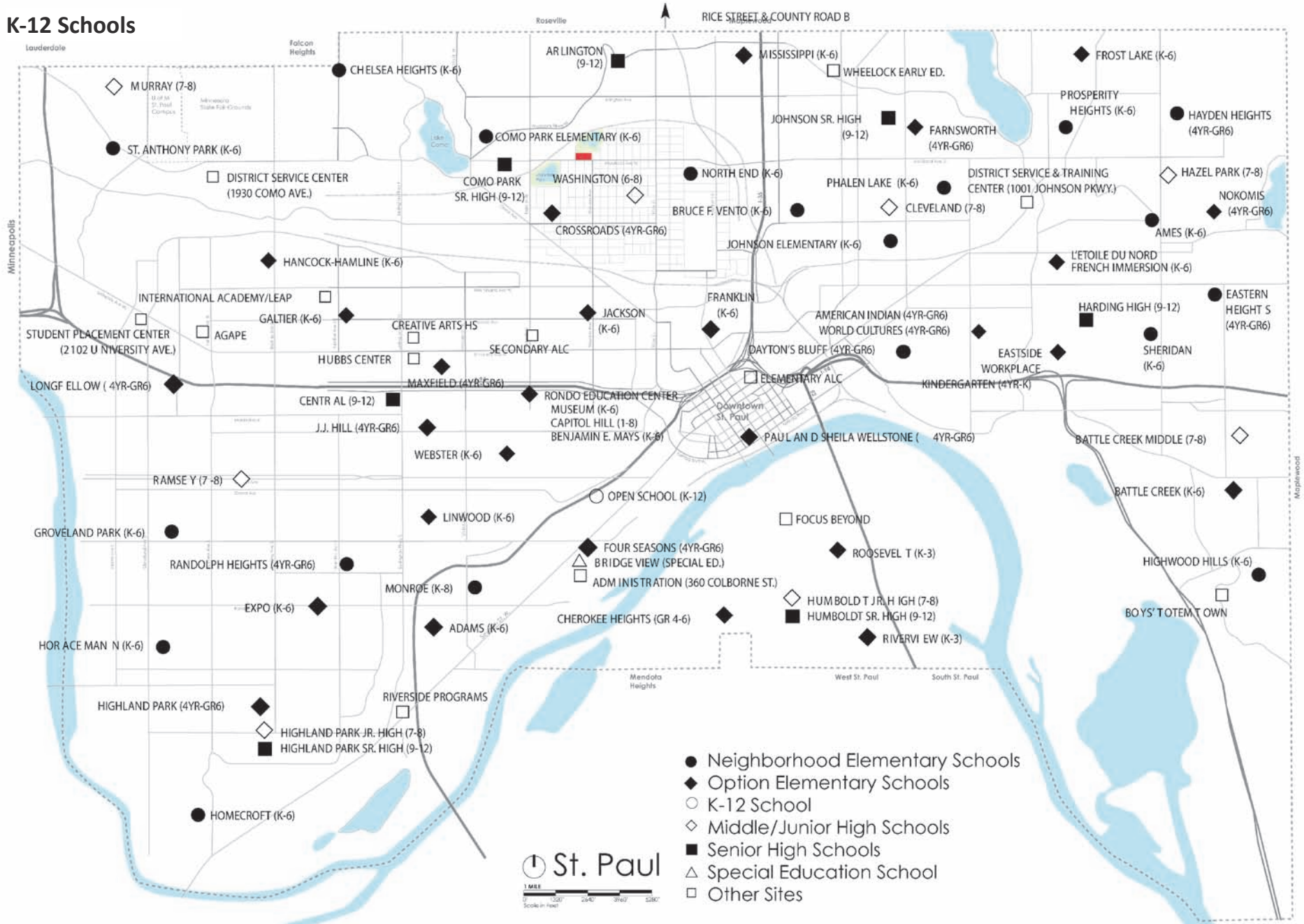
Apartment Type	Approximate Average Monthly Rent
Studio	$500
1 Bedroom	$ 550
2Bedroom	$725
3 Bedroom	$925

Owner-occupied housing in the area is currently primarily single family homes. However, the majority of the new housing stock in the area that is for owner occupation is condominiums. From the current housing stock there are two price groupings. The first is the older single family homes which have prices ranging from $50,000 to $120,000, depending largely on number of bedrooms and bathrooms and condition. The second is the new condominium and townhouse development with prices from $170,000+ varying based on bedrooms and bathrooms as well as location and additional amenities.

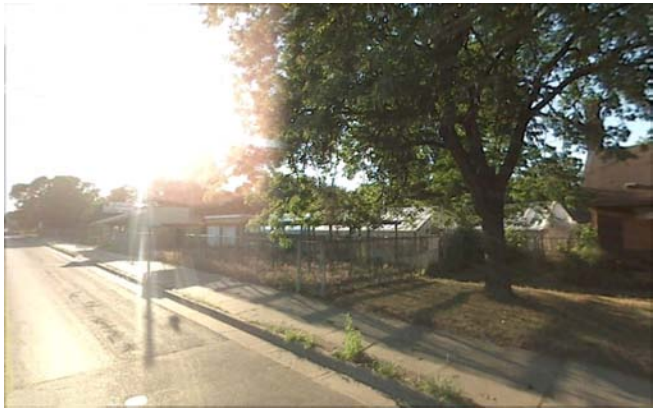
Note: For more detailed information at a larger size, please see the Greenlight Charrette information packet.

Demographics

K-12 Schools



Note: This summer St. Paul is moving several schools. For example, the Paul & Shelia Wellstone school will move into the building formerly occupied by Washington Tech Magnet. Map may not be accurate.



Images showing former structures on the site, including Larson's Greenhouse. (Captured from Google Streetview)

The Westland Commons Project location is a 3-acre piece of land owned by Sparc on the NE corner of Maryland and Arundel in St. Paul. Sparc purchased the land in 2005 and hopes to develop it sometime in the next five years. Funding requires that a portion of the development include affordable housing. Sparc decided to purchase the land as the availability to purchase a site of this caliber in older neighborhoods is very rare. Furthermore, Sparc wanted to ensure the neighborhood had input into the final development.

In 2006-7 Sparc developed plans to build 32 townhouse units on the site. However, due to the declining market, they were unable to secure funding. Sparc began to dream of creating a development which would be economically, socially, and environmentally sustainable, include green mixed-use development, and use prefabrication. In Summer 2009, they hired a Research Assistant to explore these possibilities through a lengthy paper. January 2010 saw a charrette for the site involving students and professionals through Greenlight at the University of Minnesota.

Until this point, the project was known as the Willow Reserve. In response to community concern that the Willow Reserve itself might be developed, the name was changed to Westland Commons, a combination of WESTern and MaryLAND where the land is located.The focus for development became integration of equal parts Institutional, Housing, and Agricultural use. This document is the result of a Summer 2010 Research Assistant position working towards definition of a Master Plan including these goals.

Site History

The Willow Reserve is located at the North end of the property, a nature preserve which is heavily wooded and contains a marshy pond and wetlands. The land was purchased decades ago to provide a resting area for migratory birds. As well, the wetlands function as an overflow spot for the Trout Brook storm water management system. The land is owned by City of St. Paul (Public Works), but many different organizations have a stake in any future use of that land, including, but not limited to, the aforementioned Public Works, the Capital Region Watershed District, and the City of St. Paul Department of Parks and Recreation.

Pictures above show several areas within the reserve- forest, clearing, and pond.

Willow Reserve

Plants on site include:
clover
vetch
mustard
nettle
native grasses
burdock (non-native weed-must be eliminated)

legumes replenishing nitrogen

moist, sandy/
peaty soil

include topo overlay

Willow Reserve to North

box elder/cottonwood (moisture-loving trees)

box elder

box elder

box elder
arborvitae

blue
spruce

cottonwood

sugar/silver
maple

box elder

route 3A

dense
maple

ash

honey
locust

dense
maple

MARYLAND AVE W

N

Cottonwood & Silver Maple allow for plants to grow beneath their canopies while dense maples do not

Box Elder is a weed-like scrubby tree which brings little benefit to site

Current Assets

Two community meetings and a survey in April 2009 indicated community support for the area to remain green space.

A community charrette in April 2010 asked two groups of participants to create word and image collages of possibilities for the site. (See below) Urban agriculture was a dominant interest. Senior housing, educational use, and recreation were additional interests.

Community Input

Loeb Lake Small Area Plan Recommendations
(Sections Relevant to Westland Commons)

Housing
2. Develop new housing on the Larson Nursery site along Maryland south of Willow Reserve. Due to its prominent location on Maryland, this site can be redeveloped into owner-occupied townhomes or low- to medium-density condominiums. The development should consider sensitive wetland soil conditions and be non-intrusive to the wetland. A walking path from the development to Willow Reserve would provide a highly desirable amenity.

Willow Reserve
13. Protect the natural environment at Willow Reserve. Preserve it as a habitat for bird and other urban wildlife by improving the pedestrian paths, or providing other non-intrusive equipment for human activities. Preserve the wetland for stormwater retention and surface water filtration.
14. Make Willow Reserve a low-intensity, non-programmed bird and wildlife observation area. Limit pedestrian activities to designated paths. Preserve the habitat and quietness of Willow Reserve.
15. Provide directional signs to Willow Reserve along Maryland, Arundel and Virginia.
16. Provide educational signs about the flora, fauna, geology and ecology of the area.

Park Connections
17. A park and greenspace connection between Marydale Park and Willow Reserve would enhance both amenities. The most logical place to provide this connection would be the triangular area bounded by the railroad tracks, Maryland, and Arundel, which hosts a mix of commercial, industrial, and multiple-family residential buildings. A historic wetland map from 1940s indicates that the Willow Reserve wetland was much bigger than it is today. The public space in this area could include parkland, restored wetland, and/or partially day-lighted stream with water from the storm sewer lines that lead to Willow Reserve (See Recommendation 3 under "Housing").

St. Paul Zoning Codes

The Westland Commons Area is located in a medium-density multiple-family residential district, designated RM2.

RM2 requirements include:
- 1500 ft^2 min. lot area per unit, no min. width
- 5 story, 50' height limit (no limit if zoned RM3)
- Setbacks 25' front, ½ height side, 25' rear
- Maximum lot coverage of 35%

If Sparc's property is approximately 128,675 ft^2, that results in a maximum possible combined building footprint of 45,000 ft^2.

Preliminary Break Down:
- Institutional Use 17,000-20,000 ft^2
- Housing 25,000-28,000 ft^2
- Dedicated Agriculture 42,000-50,000 ft^2 (83,000 ft^2 total non-built area, but around 33,000 fft^2 required for drives, sidewalks, shaded areas, etc.)

Divided by lot:
Smaller lot (34516 ft^2) -> 12,000 ft^2
Larger lot (94159 ft^2) -> 33,000 ft^2

Community Engagement • Education • Environmental Awareness

Required Objectives

- focus on sustainable development that sets project apart and enables it to succeed in tough market
- enough development on site for Sparc to at least break even
- affordable housing component
- mix of housing/agriculture/institutional partner

Desired Objectives

- institution anchors southwest corner
- development is low consumer and high producer of resources (energy, materials,
- fully utilize landscape (agriculture, water treatment, housing, education)
- parking is concealed (undercroft) or at least not front & center in project

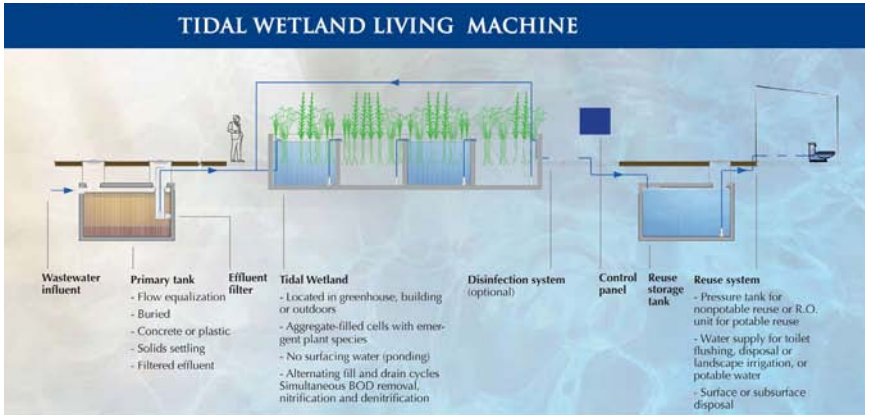
Rainwater Input to Site
128,500 ft^2 x 36" average yearly rainfall = 386,025 ft^3/year = **2,404,486 gal/year**

Domestic Water Needs (see sidebar)
If all the water arriving onto the site were captured and consumed solely for domestic use, how many residents could it support?

Average Water Use
69.3 gal/person x 364.25 days = **25,242 gal/year/person**
95 residents or 38 households

Employing Conservation Practices
45.2 gal/person x 364.25 days = **16,464 gal/year/person**
146 residents or 58 households

*According to a 2006 UN Human Development Report, each person in the US consumes over 100 gallons of water per day. It is unclear if this includes industrial and agricultural uses. At this rate, the site could support less than 66 residents, or 26 households.



By utilizing water capturing, conservation, reuse, and filtration systems, can Westland Commons be Water Independent?

Water Use Statistics

Daily indoor per capita water use is 69.3 gallons. Here is how it breaks down:

Use	Gallons per Capita	% Daily Use
Showers	11.6	16.8%
Clothes Washers	15.0	21.7%
Dishwashers	1.0	1.4%
Toilets	18.5	26.7%
Baths	1.2	1.7%
Leaks	9.5	13.7%
Faucets	10.9	15.7%
Other Domestic Uses	1.6	2.2%

By installing more efficient water fixtures and regularly checking for leaks, households can reduce daily per capita water use by about 35% to about **45.2 gallons per day** Here's how it breaks down for households using conservation measures:

Use	Gallons per Capita	% Daily Use
Showers	8.8	19.5%
Clothes Washers	10.0	22.1%
Toilets	8.2	18.0%
Dishwashers	0.7	1.5%
Baths	1.2	2.7%
Leaks	4.0	8.8%
Faucets	10.8	23.9%
Other Domestic Uses	1.6	3.4%

Source:
http://www.drinktap.org/consumerdnn/Home/WaterInformation/Conservation/WaterUseStatistics/tabid/85/Default.aspx

CoHousing Communities

CoHousing communities offer a pedestrian-friendly, high-density yet often agrarian environment similar to visions Sparc expressed for the site. Most CoHousing buildings are 2.5 stories or less, while Sparc may need to build 3.5 stories to achieve the needed amount of units.

Village Cohousing Community, Madison
http://villagecohousingcommunity.com/

Duwamish Cohousing, Seattle
http://www.duwamishcohousing.org/index.html

Puget Ridge Cohousing, Seattle
http://www.pugetridge.net/

Jackson Place Cohousing, Seattle
http://www.seattlecohousing.org/info.htm

EcoVillage at Ithaca
http://ecovillageithaca.org/evi/

Homes face pedestrian-oriented courtyard

Commonhouse with attached Greenhouse

A variety of materials and roof pitches at EcoVillage at Ithaca adds character vs. uniform block

CoHousing Model

Cedar Square Raised Beds

~ large 3' x 3' planting area
~ available in three heights
~ ideal for patio salad gardens

double-slatted base

heavy-duty liner

ideal for wheelchair-bound gardeners
(pictured above: 24" tall planter)

accessible multi-level gardening

existing mature trees incorporated into design

Silverwood Park, St. Anthony, MN (above & below)

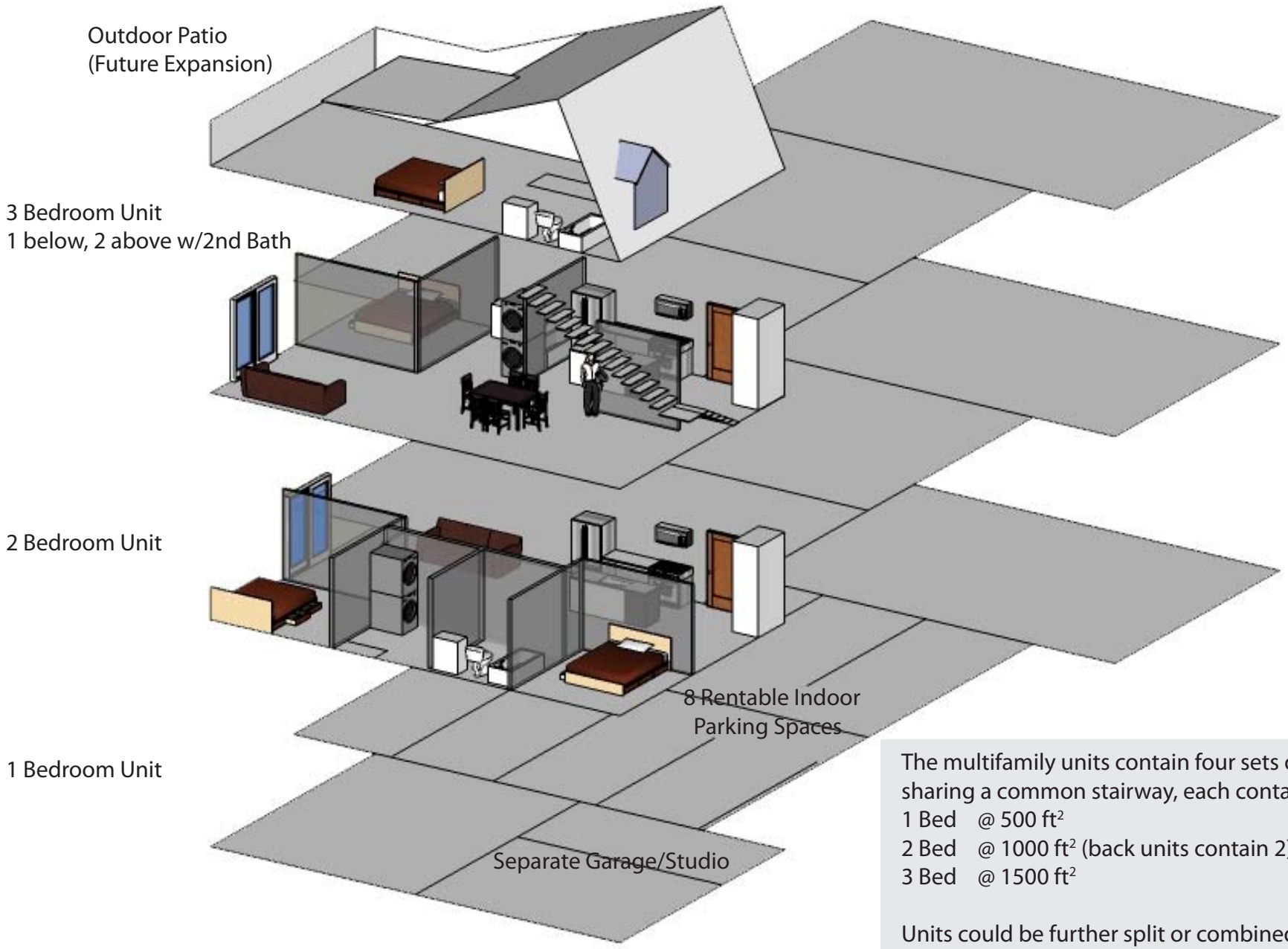
undercroft parking enclosed w/garage door
ample bike storage
(student housing in Germany)

amphitheater tucked into hillside

raingardens and other water features filter & slow water's movement to wetlands

permeable pavement used to decrease runoff

Community Features



The multifamily units contain four sets of apartments sharing a common stairway, each containing:
1 Bed @ 500 ft^2
2 Bed @ 1000 ft^2 (back units contain 2)
3 Bed @ 1500 ft^2

Units could be further split or combined to accommodate extended families or smaller families. Each unit has exposure to southern sun.

Residential Units

Charter School Space Requirements

Based on the curricular needs of a local 7-12 Charter School.

One Story (72140 ft²)		
Classrooms	18 @ 900 ft²	16200 ft²
Science Lab	2 @ 1200 ft²	2400 ft²
Combined Storage		400 ft²
Computer Lab & Storage		1840 ft²
Art		1500 ft²
Ceramics		1500 ft²
Kiln/Clay/Glazing		500 ft²
Music Room		2500 ft²
Storage		300 ft²
Recording Studio/Practice		350 ft²
Office		100 ft²
Administration/Offices		
Reception		250ft²
Principals		150ft²
Secretary		100ft²
Conference Room		250 ft²
Health		700 ft²
Teacher Workroom		500 ft²
Storage		300 ft²
Teacher Offices (50 ft²/staff-3@300)		900 ft²
Full Service Kitchen		2000 ft²
Serving		1500 ft²
Storage/Support		2000 ft²
Bike Parking		
Toilets		2000 ft²
Custodial		700 ft²
General Storage		2800 ft²
Mechanical/Electrical		6400 ft²
Circulation		24000 ft²

Optional (10400 ft²)	
Video Production	400 ft²
General Shop	3000 ft²
Fitness/Dance/Acting Studio	3000 ft²
Weight/Equip. Room	3000 ft²
Lockers	1000 ft²
1.5/2 Stories	
Cafeteria/Multipurpose	6000-9000 ft²
Entrance Lobby	700 ft²
Optional	
Library	2550 ft²
Greenhouse	as large as possible
Gymnasium	4000-14000 ft²
Auditorium or Black Box	
Total (not including options)	90,000 ft²

Parking	85 total
Faculty & Staff	30
25 teachers	
5 admin/support staff	
Students	25
400-600 students	
200 @ driving age -> 20-30 parking spots	
Residents	30
30 units	

Funding

Charter schools receive funds to cover costs for leasing their building, but they cannot use these funds to pay for ownership of a building. In 2004-2005 and as recently as 2008, this amount was the lesser of $1200 per pupil or 90% of the leasing cost.

These schools employ glass curtain walls to create organic curves in the building despite its otherwise rectangular form. They also let in plenty of natural light and give views to the outdoors while providing security. Two-story entry lobbies are full of light and welcoming.

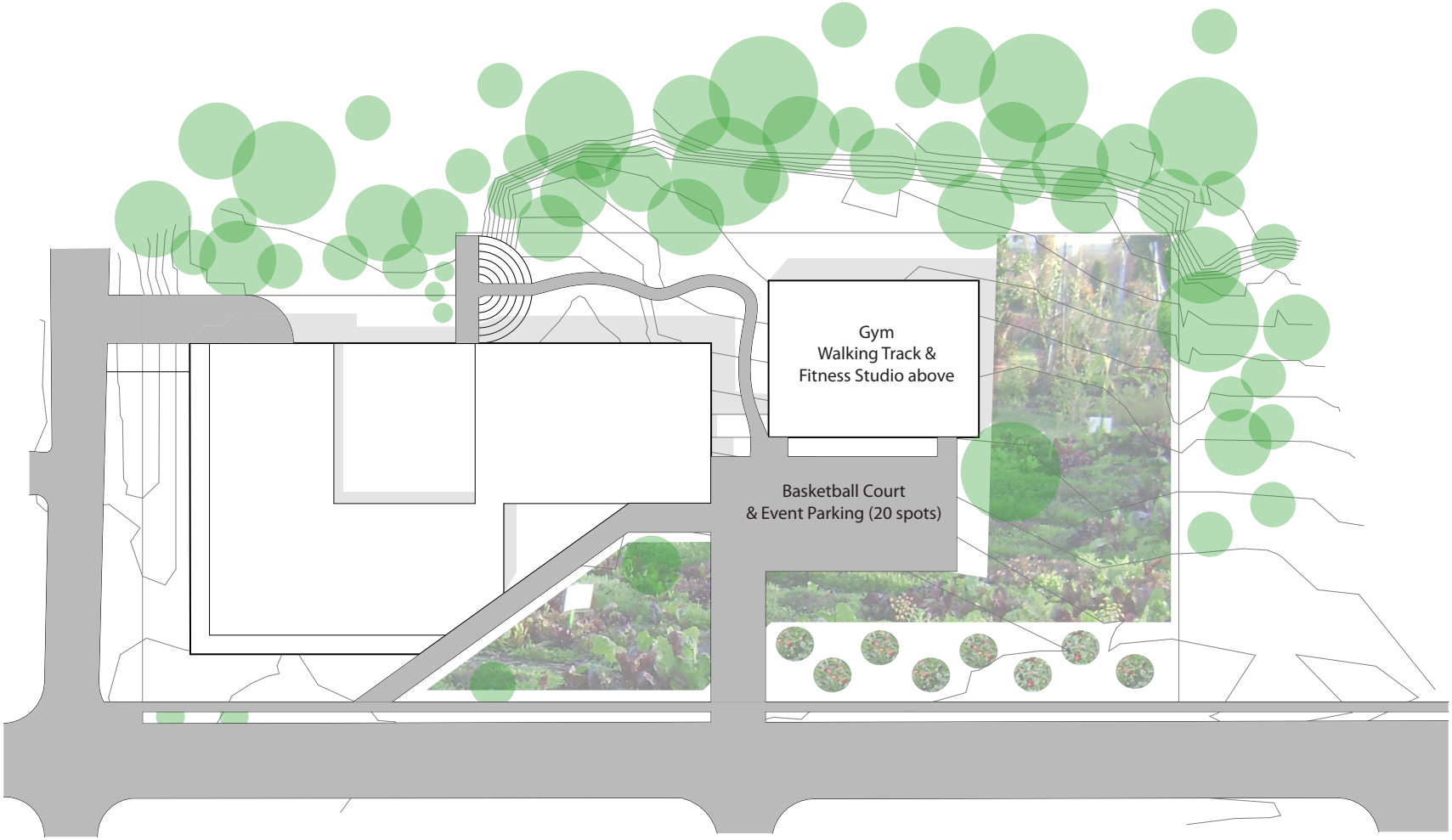
Burr Elementary
Fairfield, CT
SOM

Christo Rey Jesuit School
& Colin Powell Center
Ryan Companies
Minneapolis

Rosa Parks tried to achieve a "national parks" effect while using modern materials. Lots of windows tie the school to the outdoors. Catwalks connect second story classrooms.

Rosa Parks Elementary
Mahlum Architects
Redmond, WA

Charter School



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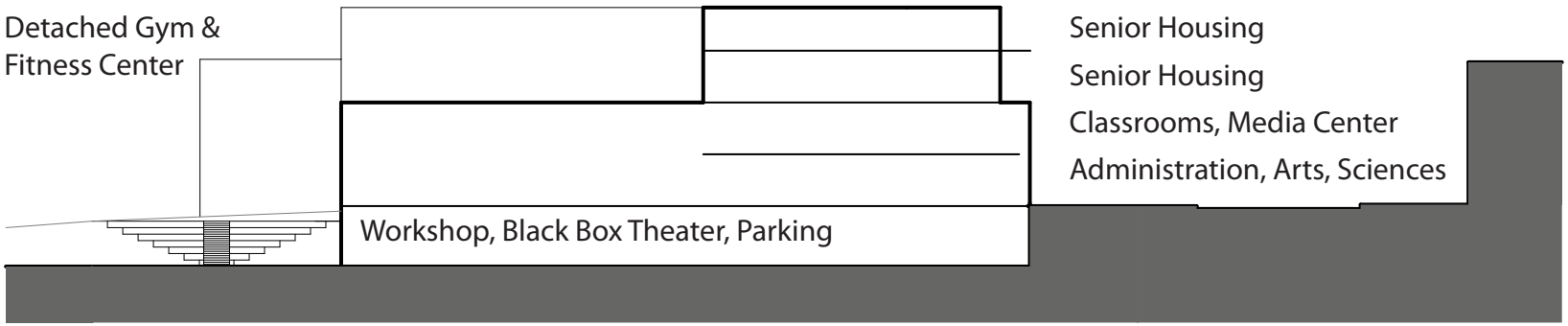

To include all enough classrooms and support services for 600 students, at least 90,000 ft^2 is required. A gymnasium, fitness center, auditorium, and library would require additional space (see space guidelines on page 20). This option explores what the site could look like if it were sold directly to a school. Senior housing could still be part of the program on top of the building, meeting funding requirements for affordable housing creation.

Option A

Footprint	(35.0%)	Institution	27,400 ft^2	Senior Housing (69 units)		First floor offices/community center
Total Footprint	45,000 ft^2	Senior Housing	66,900 ft^2	1 Bed	36 @ 600 ft^2	3 Stories Senior Housing above
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Housing	17,600 ft^2	Total Square Feet	150,300 ft^2	3 Bed	3 @ 1000 ft^2	Includes:
Large-scale Ag	25,000 ft^2	Parking (above)	15	Multiplex Housing (56 units)		daycare for 125 children
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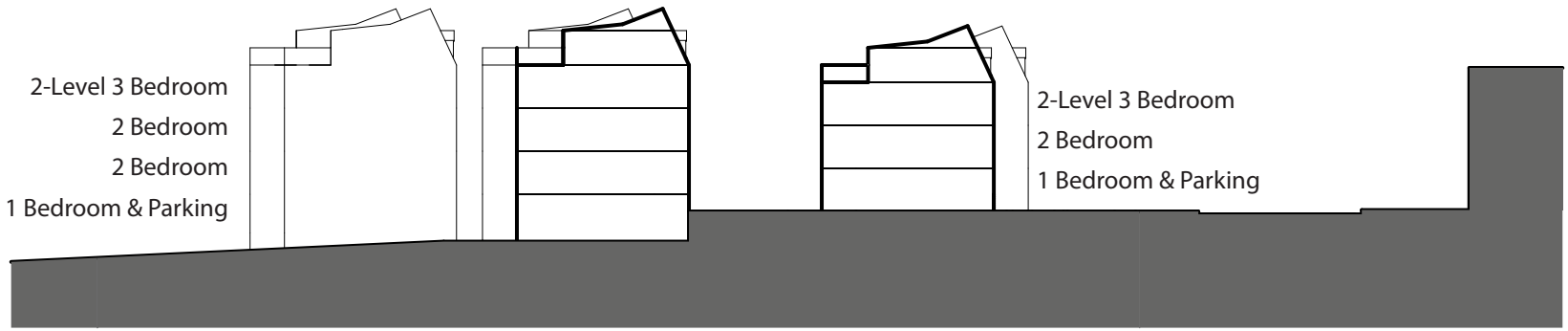
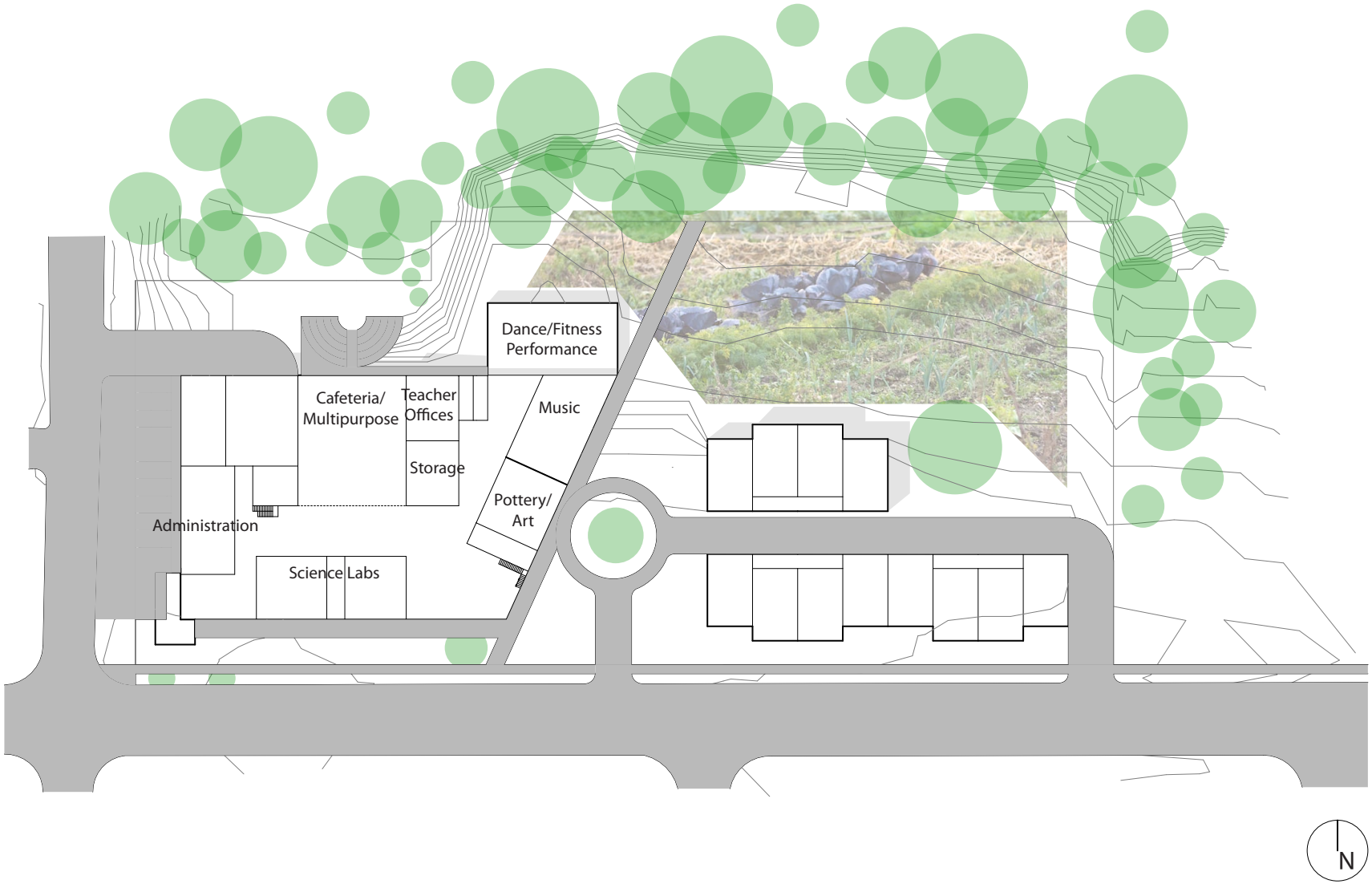
		Total Parking	115	3 Bed	16 @ 1500 ft^2	event space

Option B



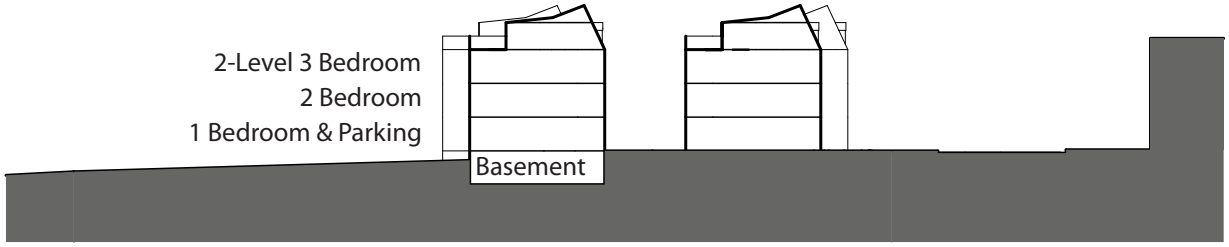
This option provides125 units of housing, a daycare, community facilities, and office space. However, without the school, the demand for parking is incredibly high, and there may be too many people living on the site to maintain a small community feeling. The height of the senior housing/office building could be reduced, diminishing the project's scale and putting more emphasis on the multiplex housing.

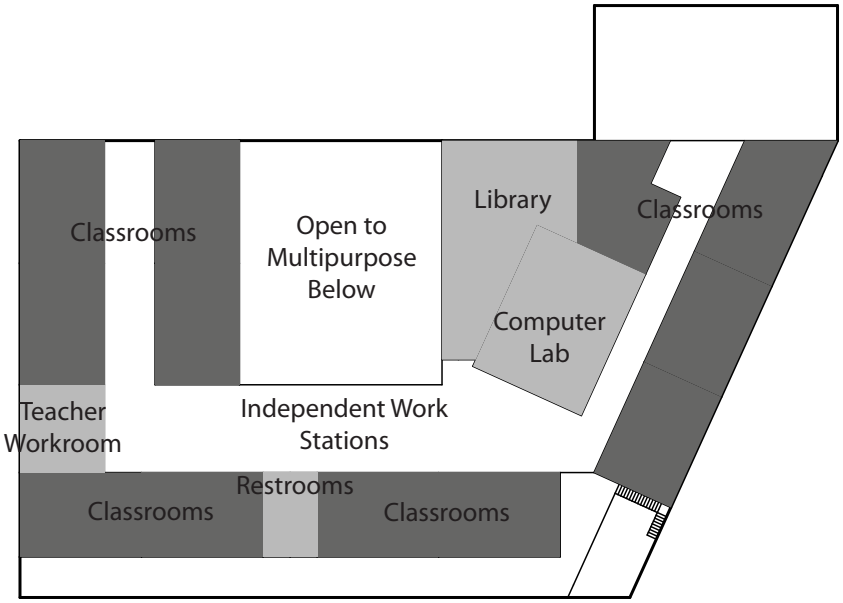
Option B



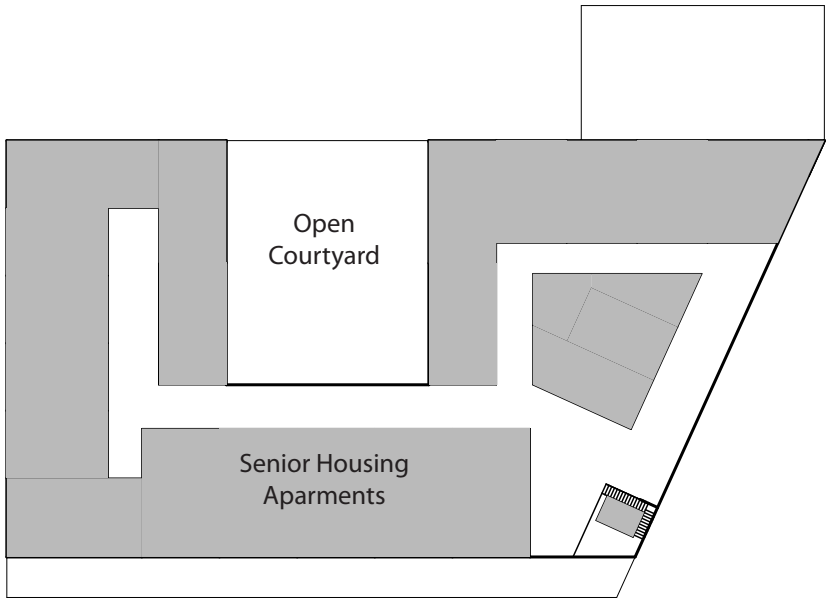
Footprint	(35.0%)	School	55,600 ft²	Senior Housing (44 units)		2-Story School for 300 students
Total Footprint	45,000 ft²	Senior Housing	43,200 ft²	1 Bed	20 @ 600 ft²	2-Story Senior Housing above
School	32,000 ft²	Multiplex Housing	24,000 ft²	1 Bed + Den	10 @ 720 ft²	3 Multiplex units
Housing	13,200 ft²	Total Square Feet	149,000 ft²	2 Bed	14 @ 900 ft²	Includes:
Large-scale Ag	32,000 ft²	Parking (above)	17	Multiplex Housing (36 units)		science labs & full kitchen
		Parking (below)	68 - 85	1 Bed	12 @ 500 ft²	performance & rehearsal spaces
		Parking (multi-plex)	30	2 Bed	12 @ 1000 ft²	12 classrooms (25 students each = 600)
		Total Parking	115-132	3 Bed	12 @ 1500 ft²	

Option C





Floor 2



Floors 3 & 4

An issue with placing a school AND housing on the site is that if the school eventually needs to expand, it will have no where to do so and would need to move. Best practices in school design **suggest that a school is built on enough land to allow for future expansion**. One way of addressing this issue is including senior housing on the upper floors of the school, with the option of the **school eventually taking over the senior housing** for classroom space. This would require a leasing situation for the senior housing rather than purchasing of condos. Another option would be to build the **multifamily housing units using prefabricated modules**. They would be costly to move, but at least they could be reused.

Option C

Web Resources

Sustainable Sites Initiative
http://www.sustainablesites.org/

Living Machine installers
www.livingmachines.com/

Permaculture
www.permaculture.org/

Plants for a Future Database
http://www.ibiblio.org/pfaf/D_search.html

Architecture Firms
McCamant-Durrett (The CoHousing Company)
http://www.mccamant-durrett.com/index.cfm
Kraus Fitch Architects
http://www.krausfitch.com/

Minnesota Charter School Handbook
http://www.centerforschoolchange.org/mn-charter-school-handbook/facilities.html#law

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Het Meesterwerk
30 apartments above primary school p. 222
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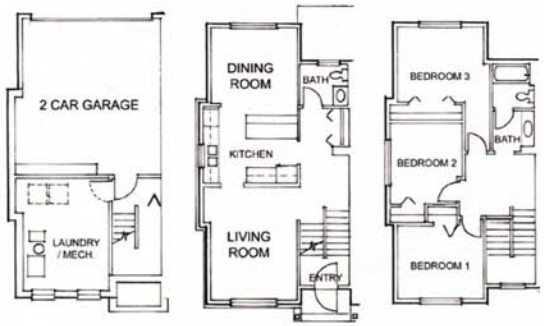


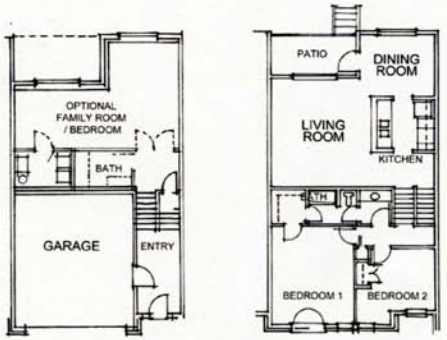
UNIT A PLANS

UNIT A FRONT ELEVATION

SITE PLAN

WILLOW RESERVE TOWNHOMES

LHB sparc



UNIT B PLANS

UNIT B SIDE ELEVATION

UNIT B REAR ELEVATION

UNIT B FRONT ELEVATION

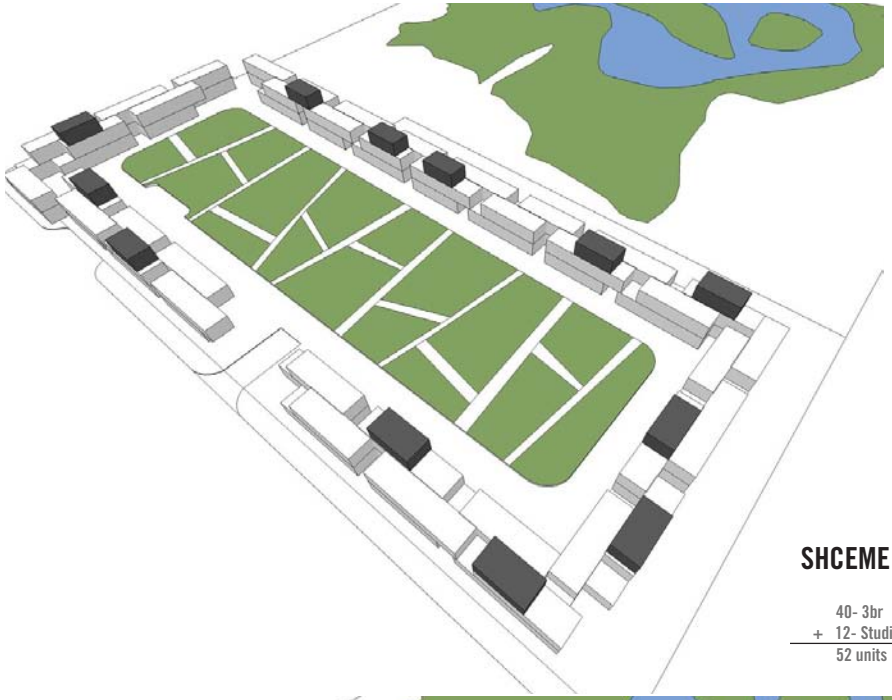
WILLOW RESERVE TOWNHOMES

LHB sparc

Previously developed plans which were unable to be implemented due to the recession. 36 units.

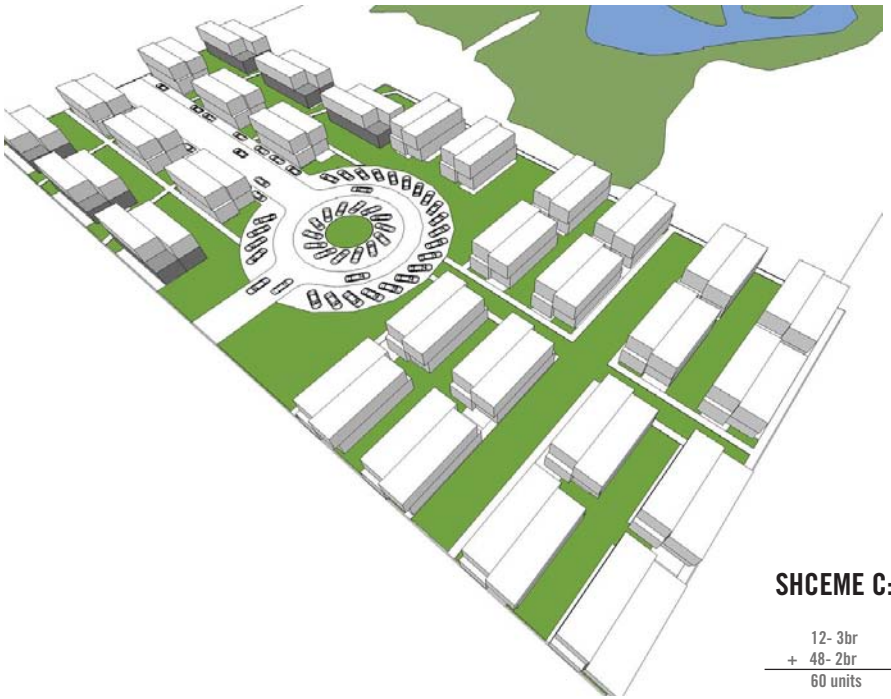
SHCEME A:

30- 3br
12- 2br
\+ 8 Studio
50 units



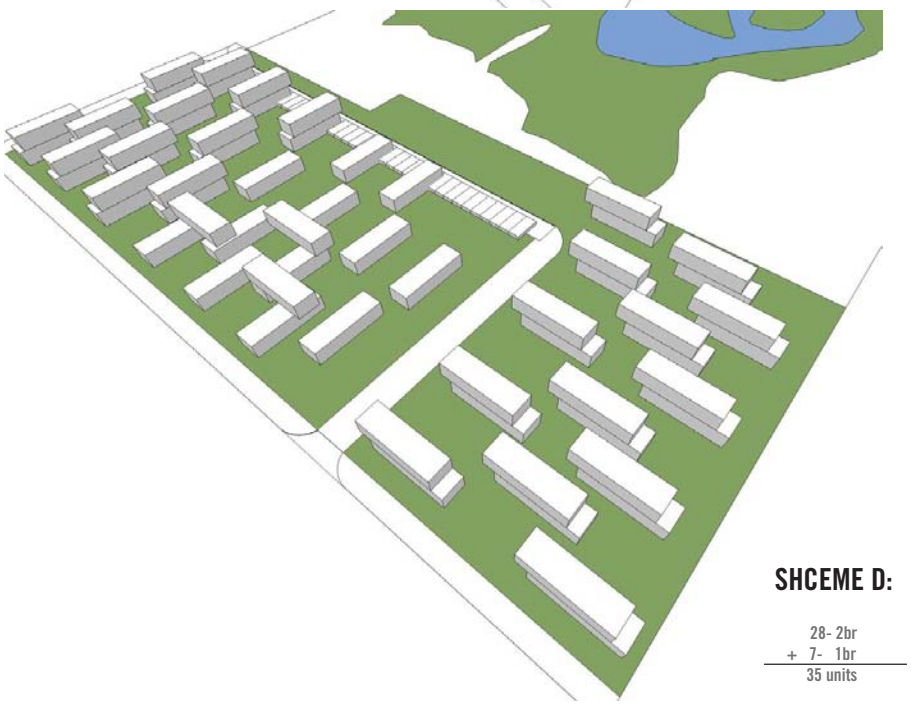
SHCEME B:

40- 3br
\+ 12- Studio
52 units



SHCEME C:

12- 3br
\+ 48- 2br
60 units

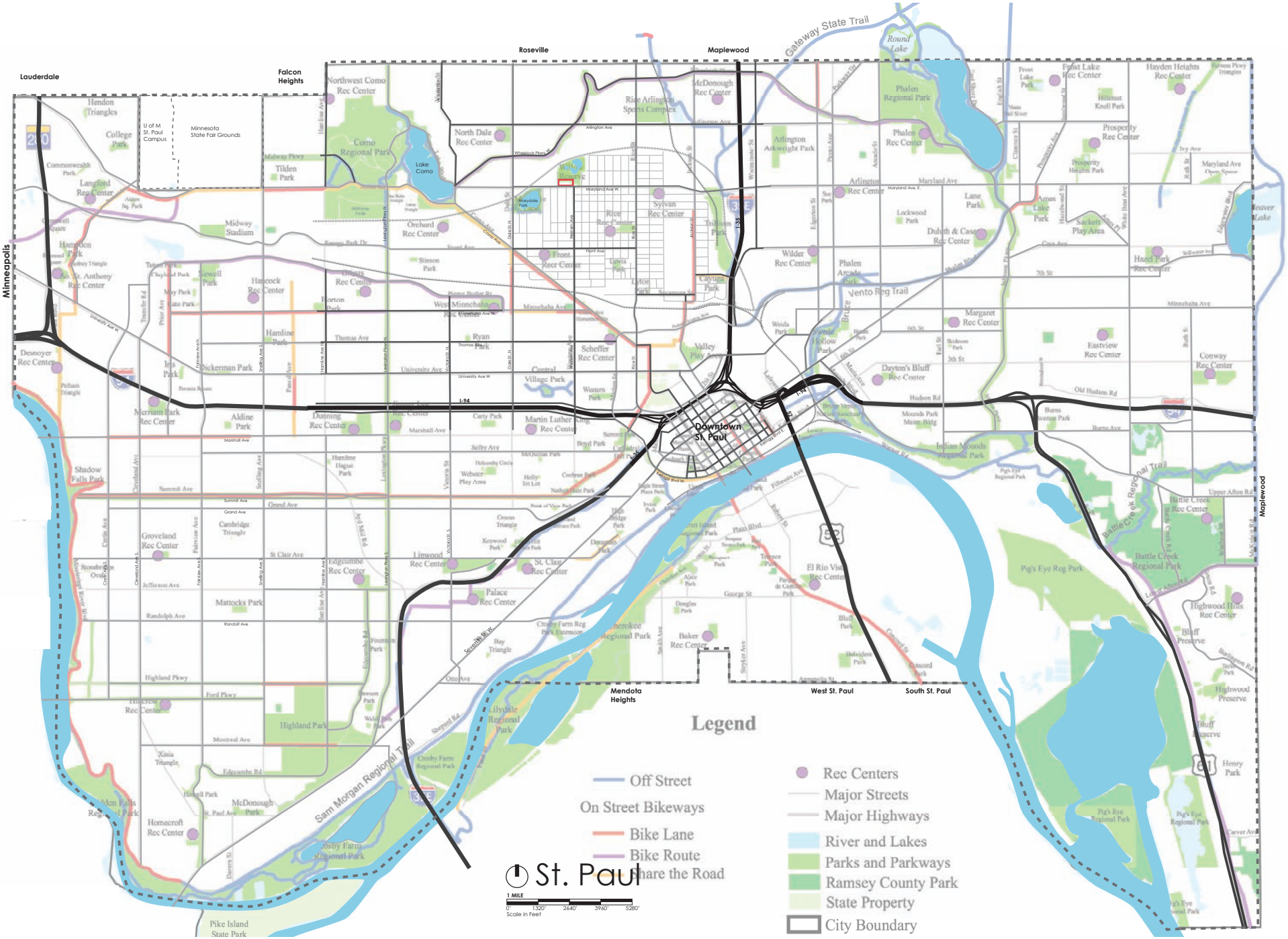


SHCEME D:

28- 2br
\+ 7- 1br
35 units

Quick analysis of site plan possibilities with use of weeHouse modules.

Alchemy Architects



The following contains the highlights from the work of seven participating groups of students, faculty, & design professionals.

Greenlight Charrette

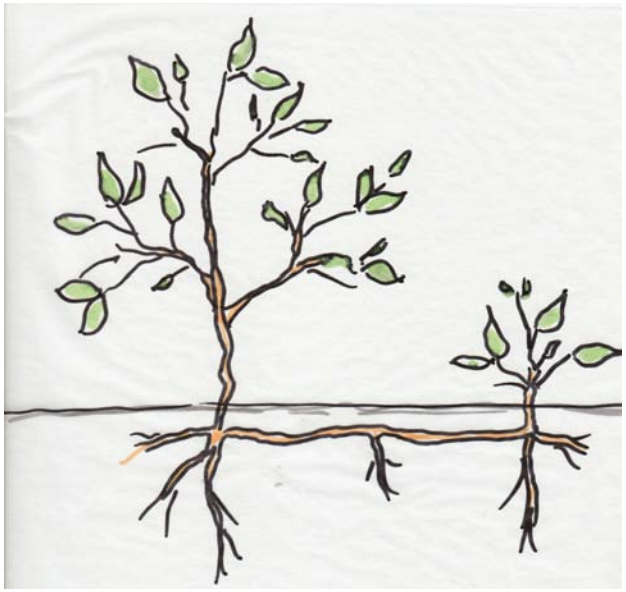
Guiding Principles

Development fosters the transportation of people, energy, waste, commodities and ideas in, out, and through the community. It works to eliminate "waste" and instead looks at secondary and tertiary uses of all resources.

Energy Optimization – Efficient use of natural resources
The Mix – Flexibility in use of the site
Agro-Dwelling – Community using land as a resource

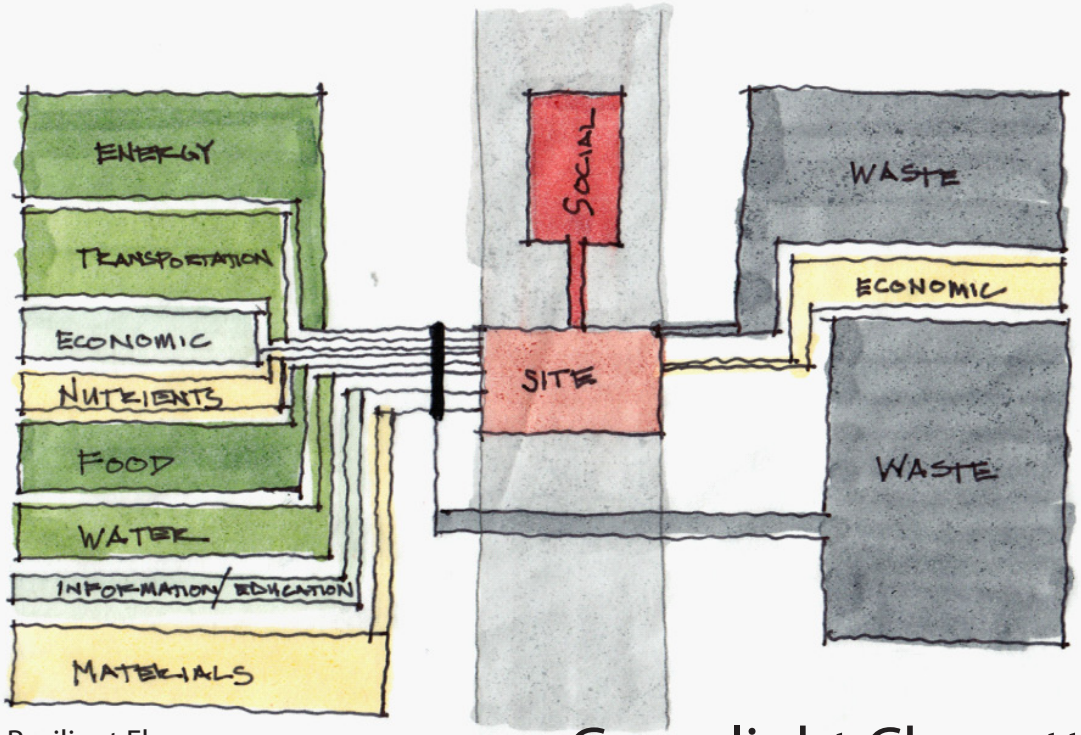
"urban density of self subsistence"

COMMUNITY RELEVANCE: Be locally appropriate; build on local strengths, needs, and desires
STEWARDSHIP: Respecting and building on local resources (history, culture, ecology)
GO BEYOND ZERO ENERGY AND CARBON NEUTRAL: Be a net exporter of energy, clean water, clean air, bio-recycling
DESIGN FOR ALL SPECIES: Design for the wider ecological community, focusing on maximum diversity (x2)
INTEGRATION: Design across scales and ecological issues and topics



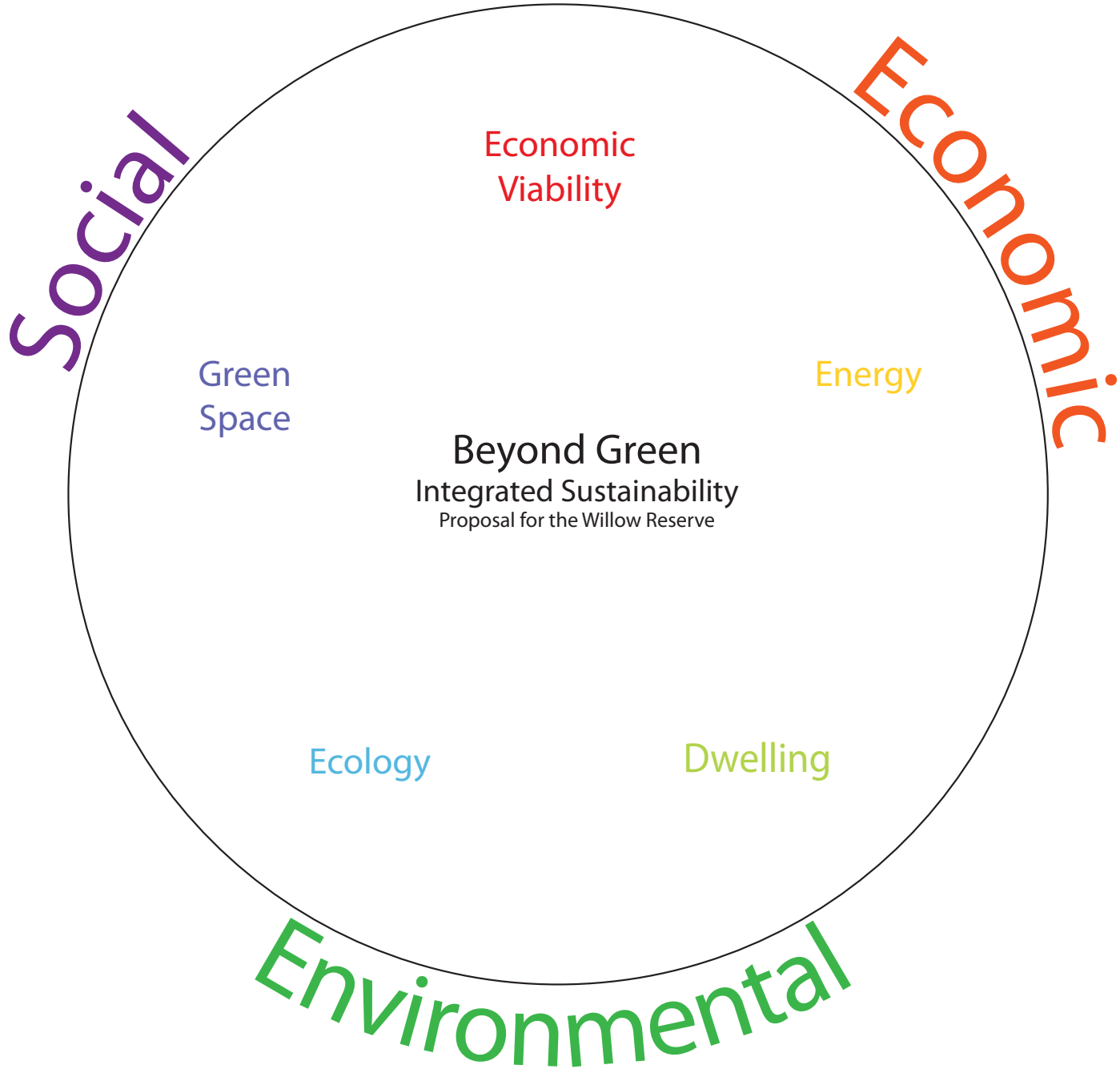
Rhizome Above

HORIZONTAL STEM OF A PLANT THAT IS FOUND UNDERGROUND SENDING OUT ROOTS AND SHOOTS FROM ITS NODES.



Resilient Flows

Greenlight Charrette



Sparc's Project Objectives given to participants.

Greenlight Charrette

Programmatic Components

Housing
- Diversity of sizes and types (mixed arrangement)
- Individual Mixed Income Family Units
- 80% Affordable, 20% Market
- Multi-family
- Family courtyard housing
- Intergenerational Housing
- Live/work – street visibility
- Studio
- Garden Family Units
- Larger, mixed use building
- Townhomes

Growing Plants
- Community gardens (x2)
- Green wall gardens – can support affordable construction using standard design materials such as block walls
- Greenhouse This space will incorporate multiple flows, both in and out. It connects people to the land and the community.

Growing People
- Café/Teaching Kitchen
- Educational Outreach/ and observation - wetlands
- Specialized education / vocational training facility to teach based on applied technologies of the site (aka apprenticeship) x3
- Educational entertainment shared, but separate

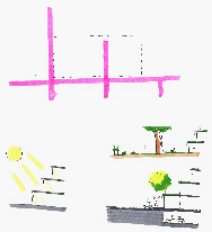
Growing Community
- Intergenerational play
- Community Center – A place for people to gather and educate, along with a shared workshop for bicycles and other hobbies.

Livelihood
- Commercial space within development for hospice care, chronic rehabilitation based on contact with nature.
- Residents work in exchange for a place to live
- Community produces a product (CSA, Art, food product)


Pedestrian acess


Housing diverity: Multi-family


Housing diversity: Private family




Community Garden


Root Cellars


Communal Kitchens


Community Vocational Education


Private Gardens

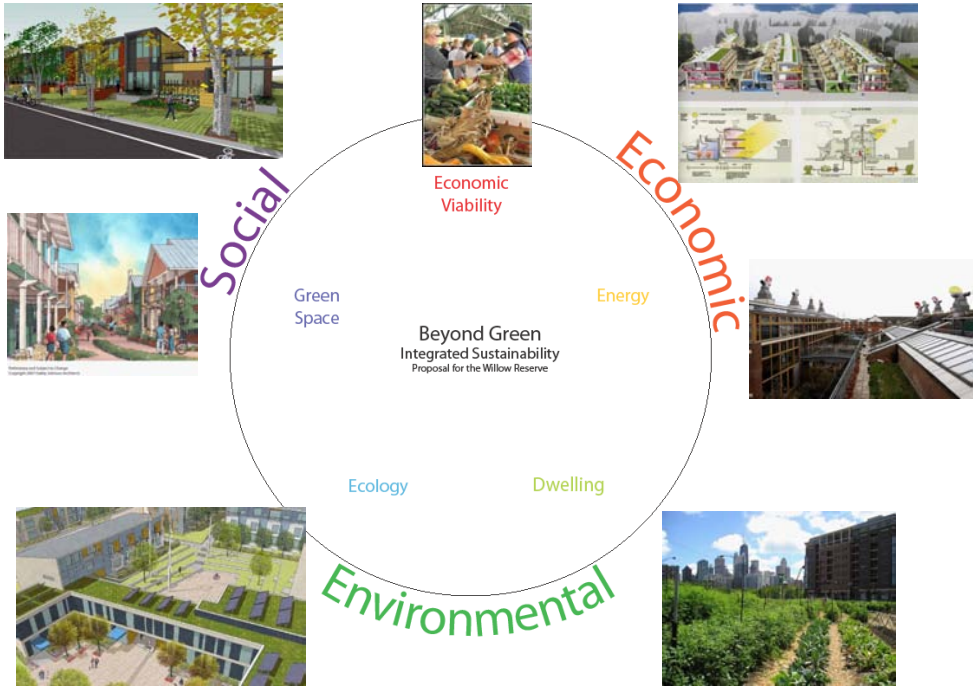

Wetland Farming

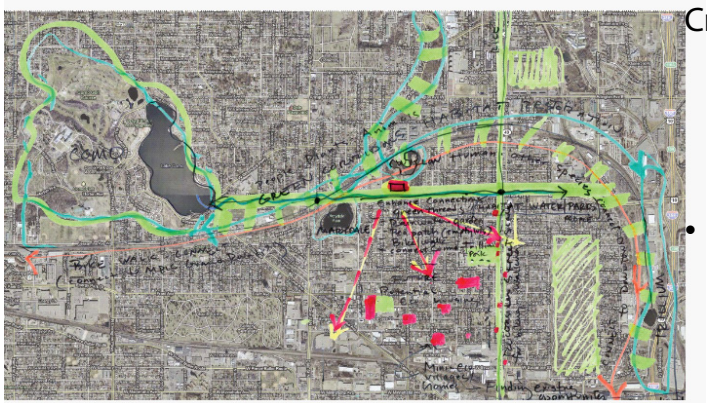

Education


Permaculture


Bike Shop (Retail)


Co-Housing





- Create ecological links from Como to Trilium Park
- Ecovillage "seeded" thru the community

Greenlight Charrette

Building Components

Passive Design– reducing active energy
- Orientation, massing, Passive House Standards
  - http://www.passiv.de/07_eng/index_e.html
  - http://www.passivehouse.us/passiveHouse/PHIUSHome.html

Energy Production & Management
- Incorporate active strategy as needed (solar, geothermal, wind as energy co-operative)
- Renewable electric (PV) and daylighting
- District Systems for site buildings & energy efficiency (x3)
- District Systems for Neighborhood (x2)
  - Geothermal well field under restored wetland provides district level energy
    - 3 tons/family
    - 50 to 200 year life expectancy
    - 1 to 20 year payback for large scale system

Integrated Systems
- Greywater treatment
- Built in "Living Machine" waste treatment system (x2)

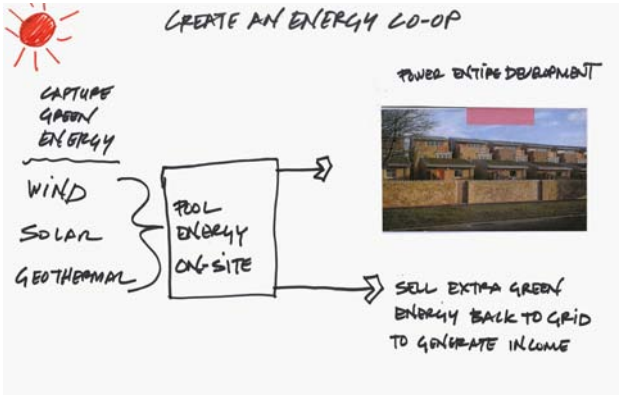
Site Strategies
- Control and utilize storm-water flows for site use (x3)
- Include SPARC site and Willow Reserve (15+ acres)
- Balance use of land (agriculture/buildings) with natural environment- connect withWillow Reserve (x3)
- Increase density at appropriate scales (4 story max using site topography)

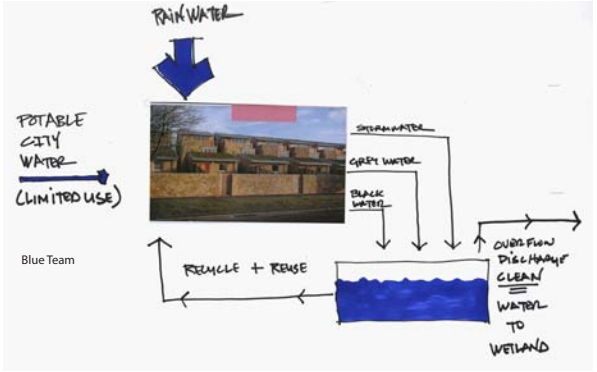
Pedestrian Priority (x2)
- Activate street edge with people program & activities
- Promote pedestrian scale materials and quality
- Pedestrians invited through the site by bringing nature from Willow Reserve toward the street: "green corridors."

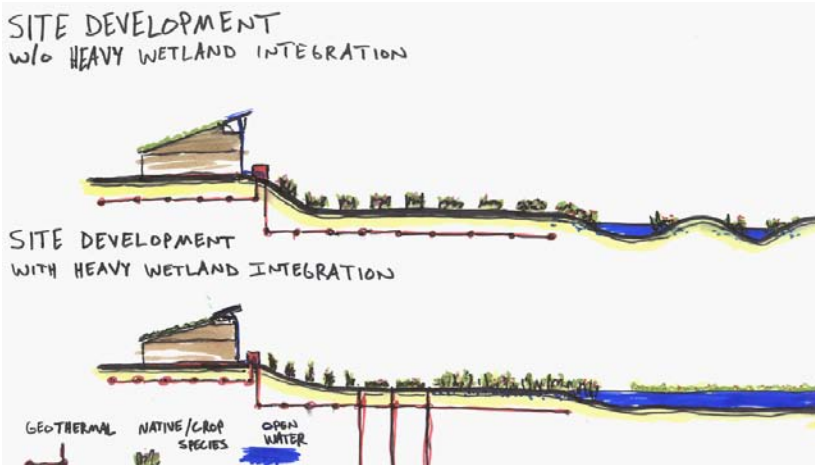
Parking
- Communal Parking: underground and/or solar panel shaded lot.
- Hidden Garages (x2)

Housing
- Private balconies conducive to gardening.
- Innovative designs to reduce energy consumption.

Materials
- Natural materials, age gracefully, develop character (wood, concrete)
- Affordable combinations (CMU block hidden by green walls/gardens)







Greenlight Charrette

SOLAR COMMUNITY

Rolf Disch

Freiburg, Germany

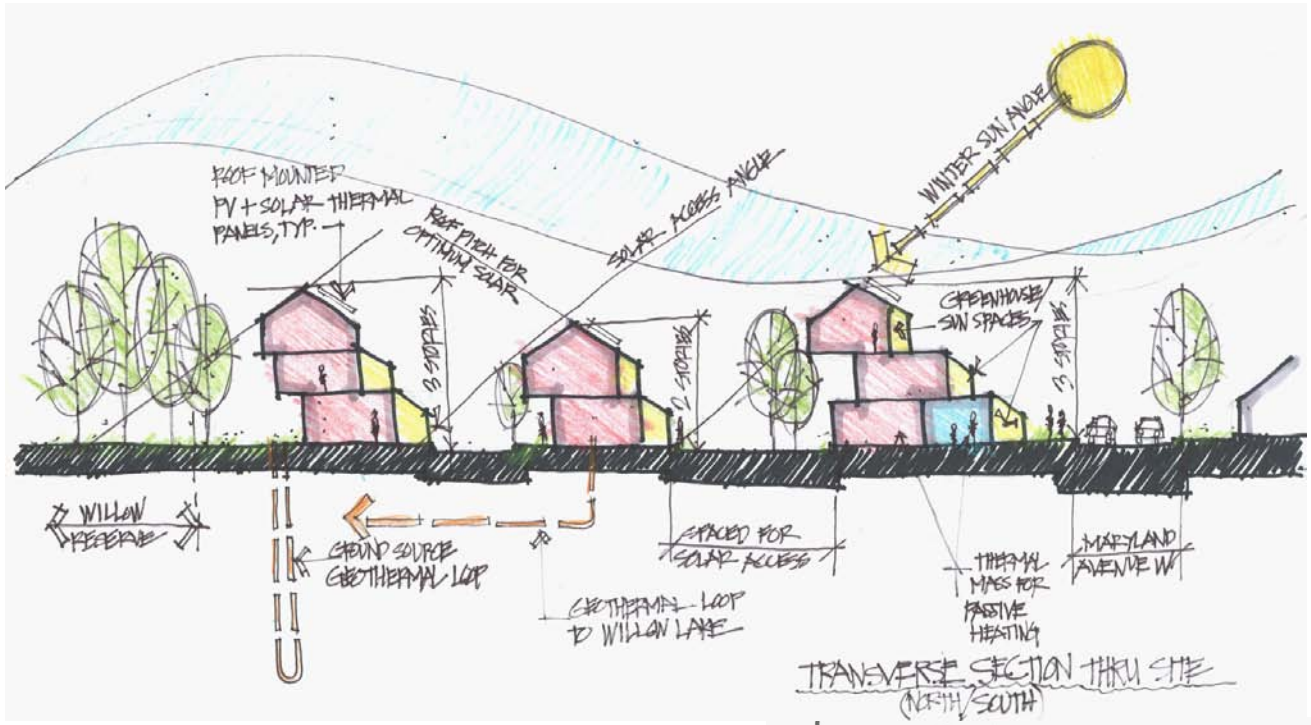
ISSUES

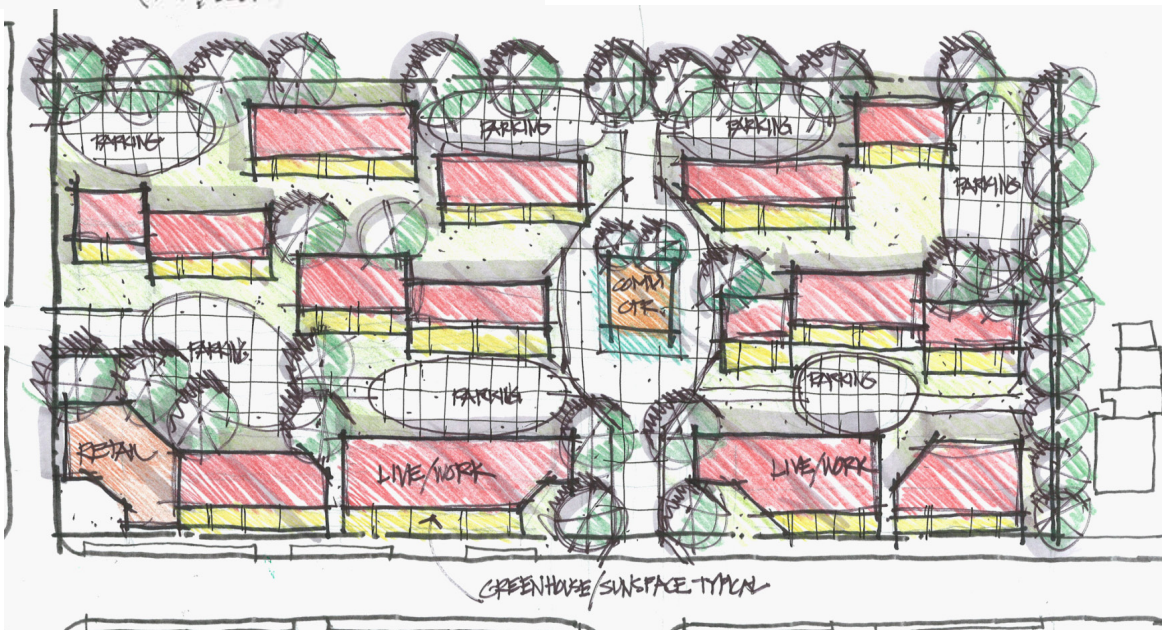
- ZED
- Passive solar with active systems
- Mixed use; commercial and retail on north-south street; solar community behind on east-west axis

Performance Profile[i][ii]

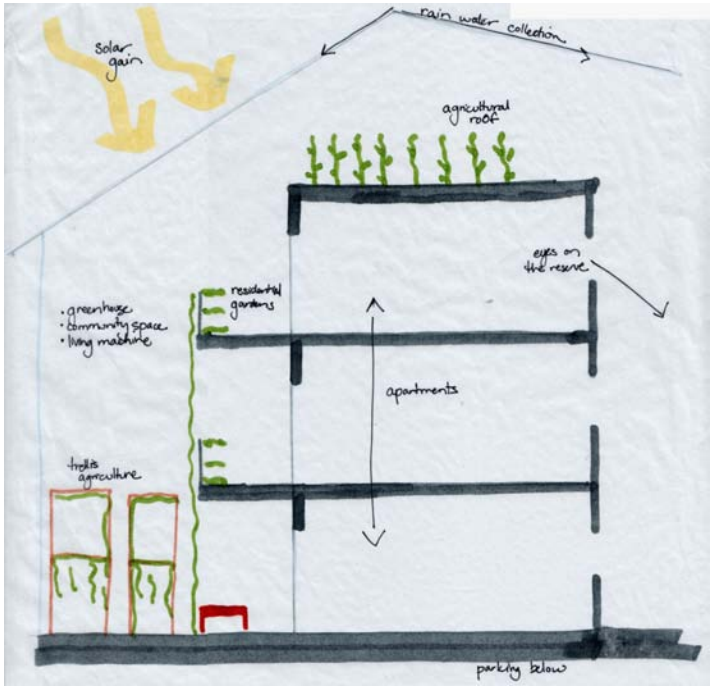
•Total annual building energy consumption: estimated -2.02 kBtu/ft2 [-6.4 kWh/m2]
•Total annual on-site energy produced: estimated 17.6 kBtu/ft2
•Size of photovoltaic system: 39.6 kW grid-tied photovoltaic array supplies 61,250 kWh
•Size of solar thermal system: solar hot water system, size not available
•Carbon dioxide emissions: -4.6 metric tons of CO_2; 45.3 metric tons of carbon dioxide emissions are outweighed by 49.9 metric tons of carbon dioxide offsets

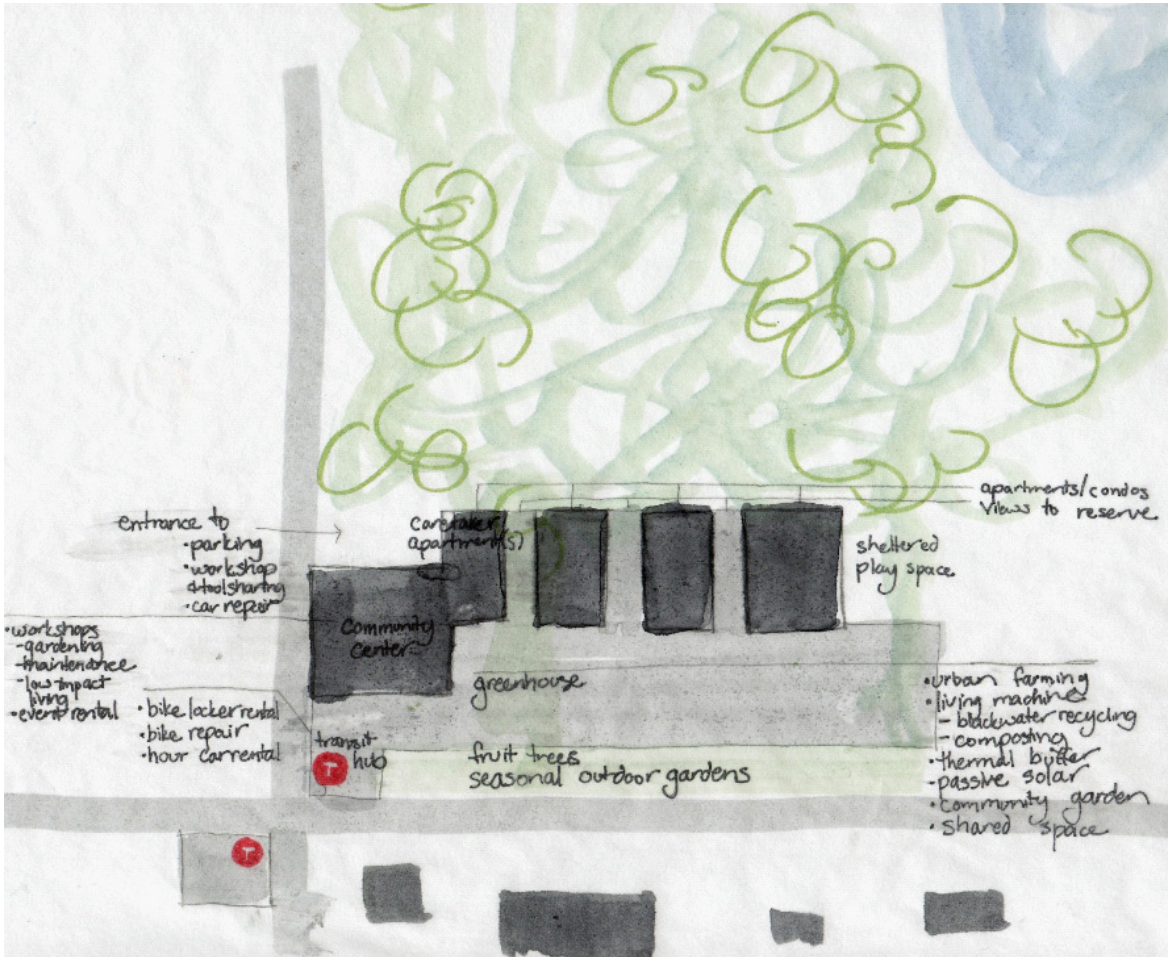
Greenlight Charrette





Greenlight Charrette

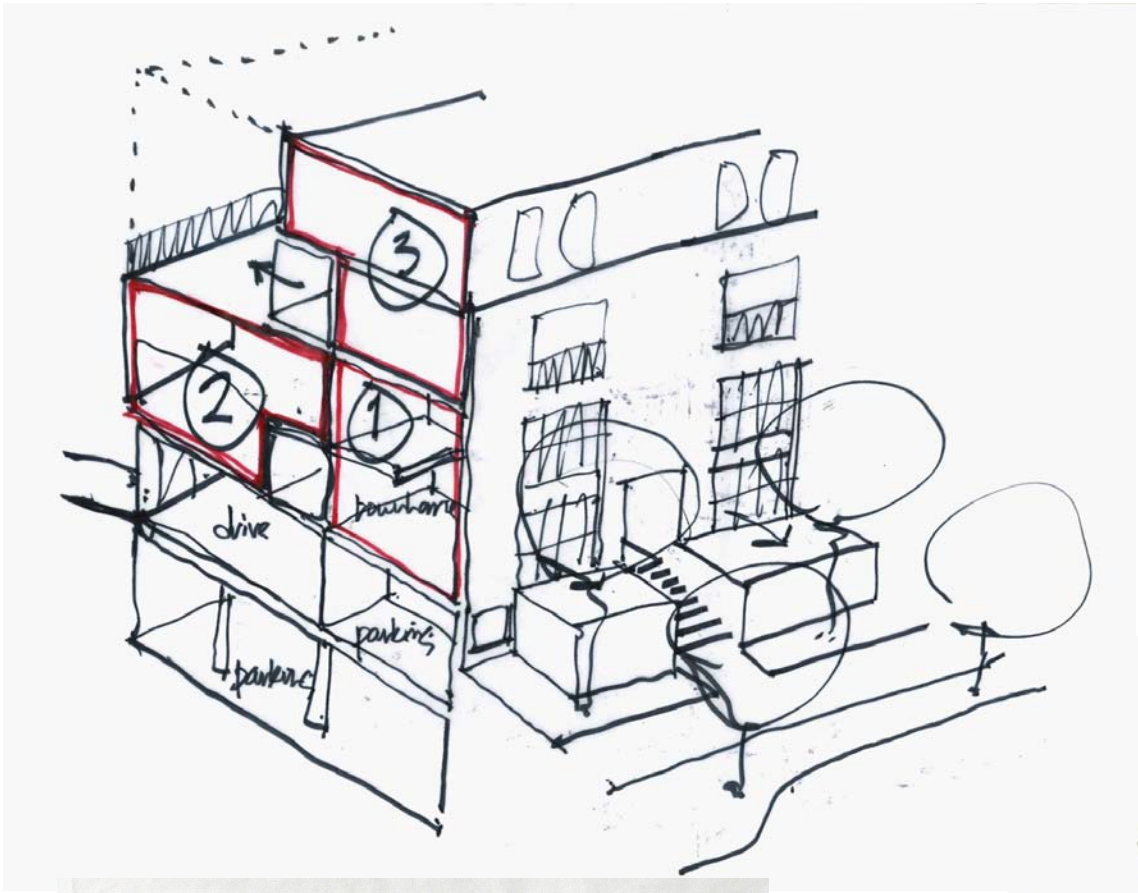


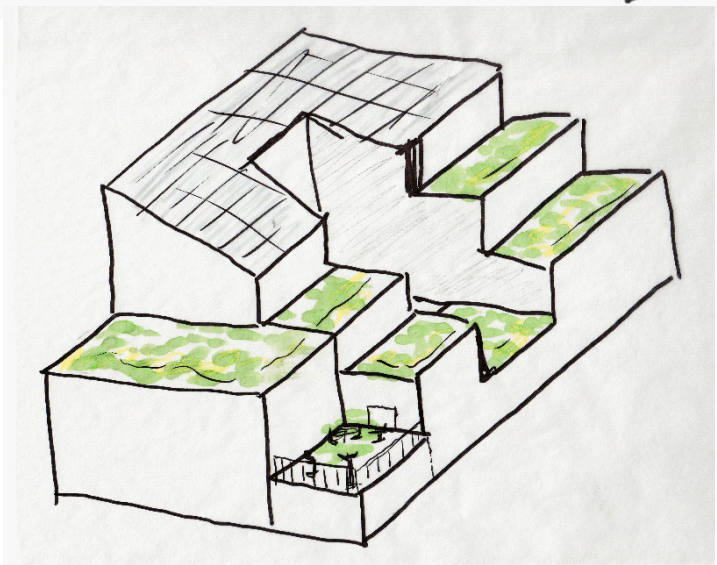


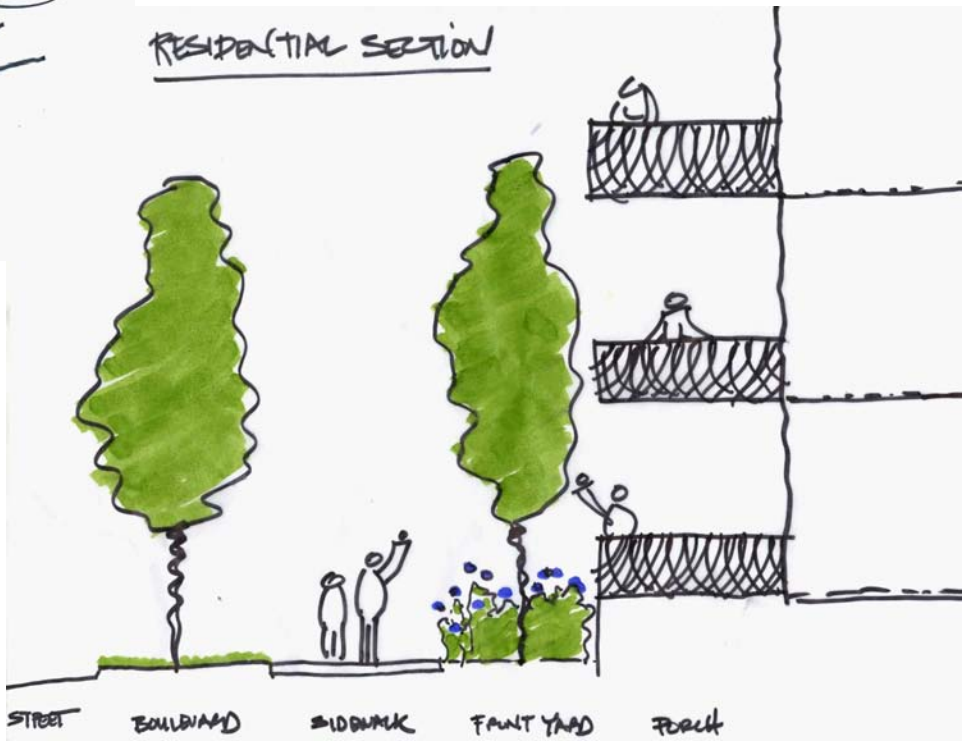
Greenlight Charrette

Site Carrying Capacity = Density

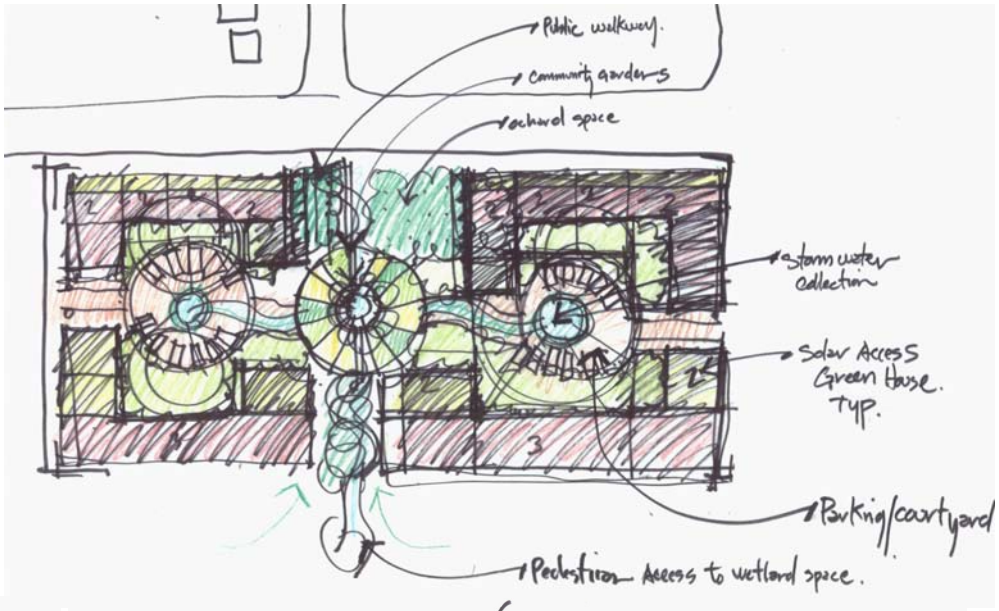
- Many Layers of Use
- Energy, Water, Waste, Employment & Economic capacity determine site density
- Long Term Building Flexibility (moveable, portable)

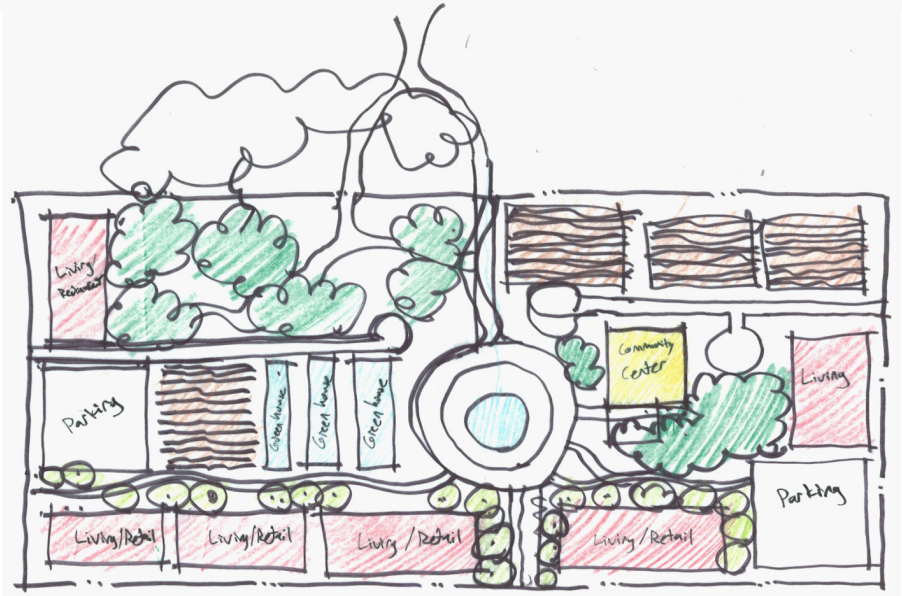




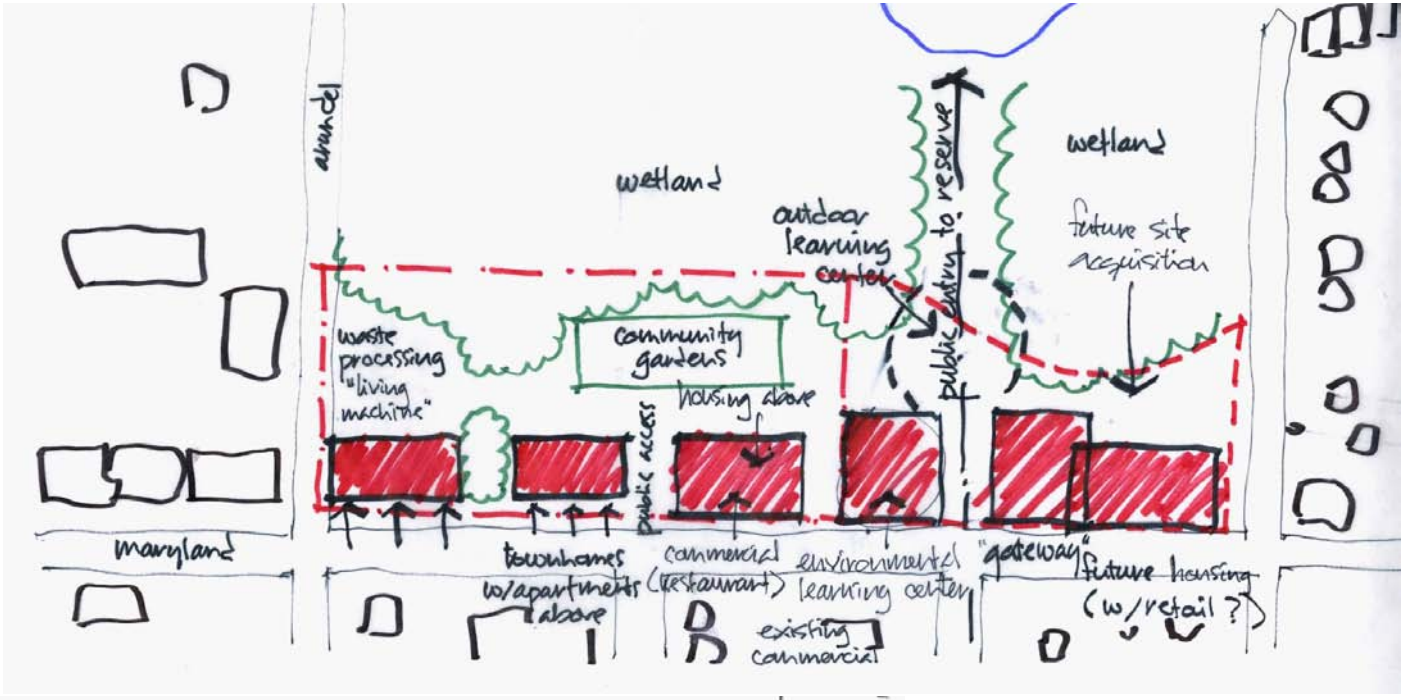


Greenlight Charrette





Greenlight Charrette



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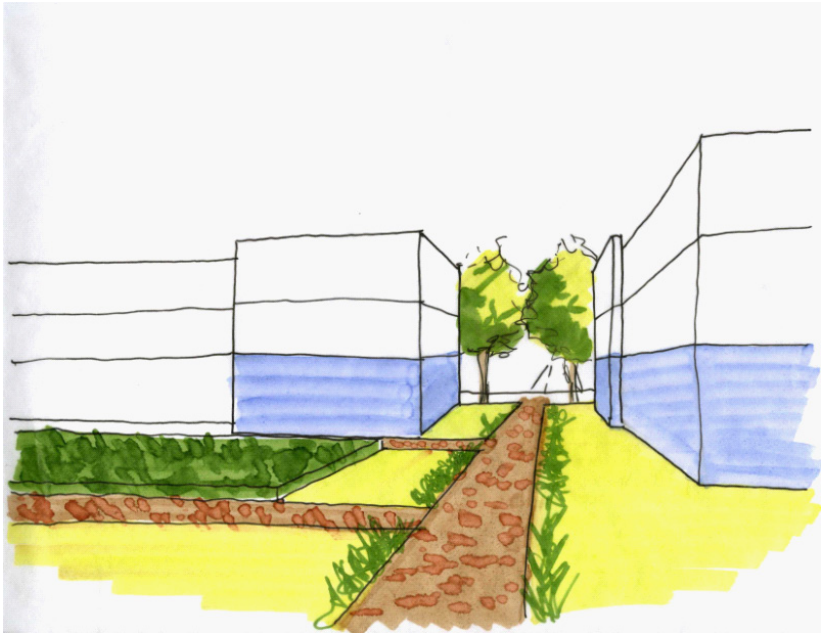

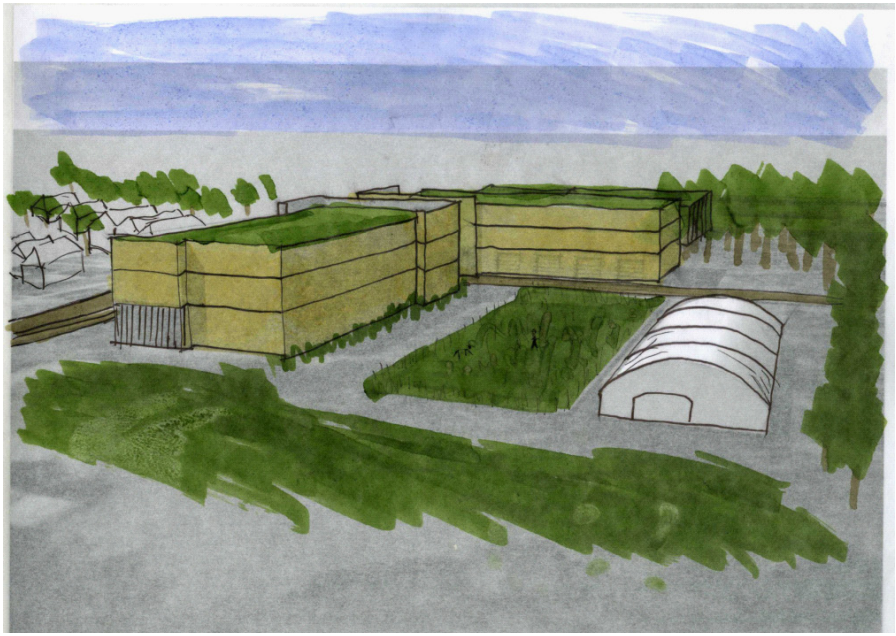

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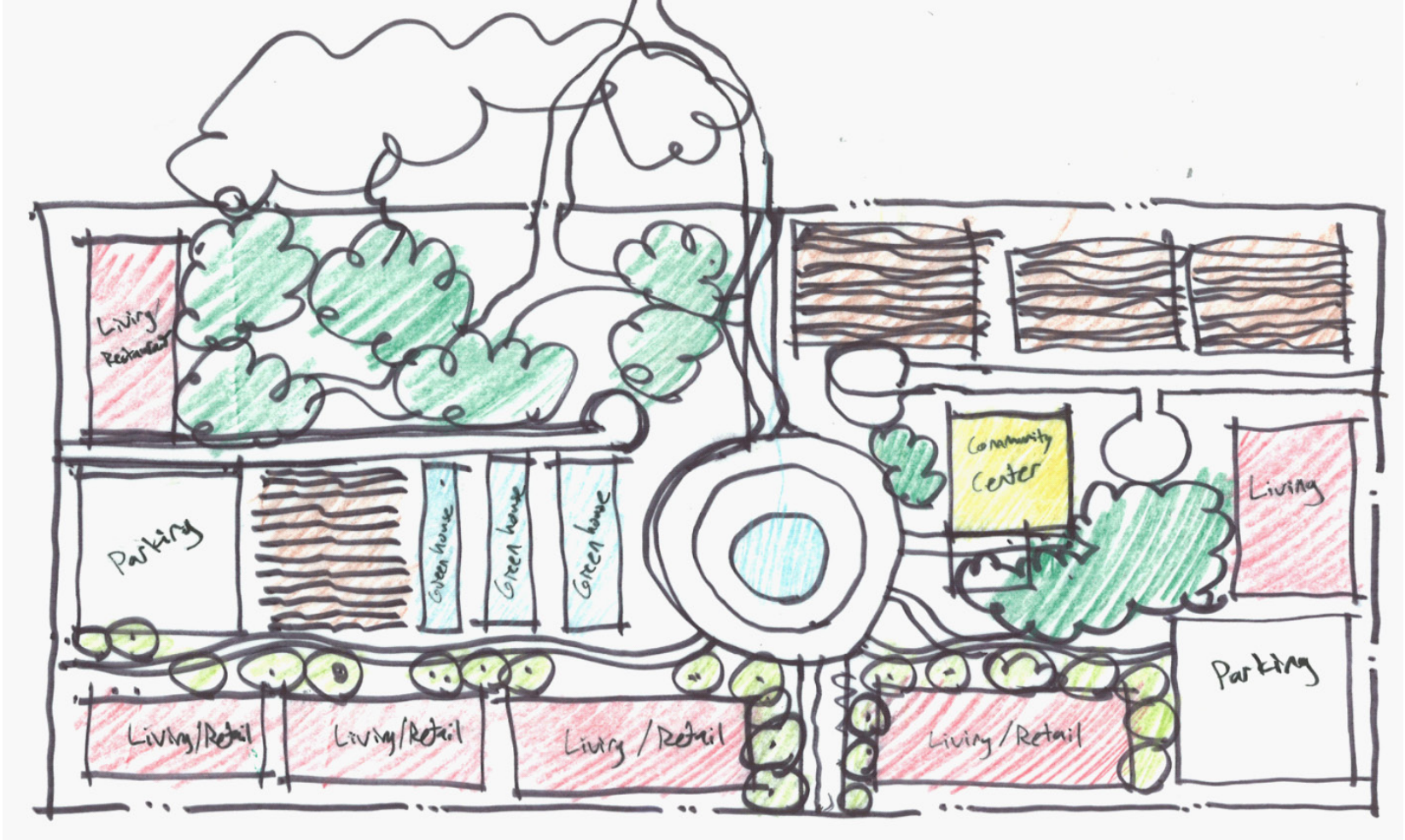
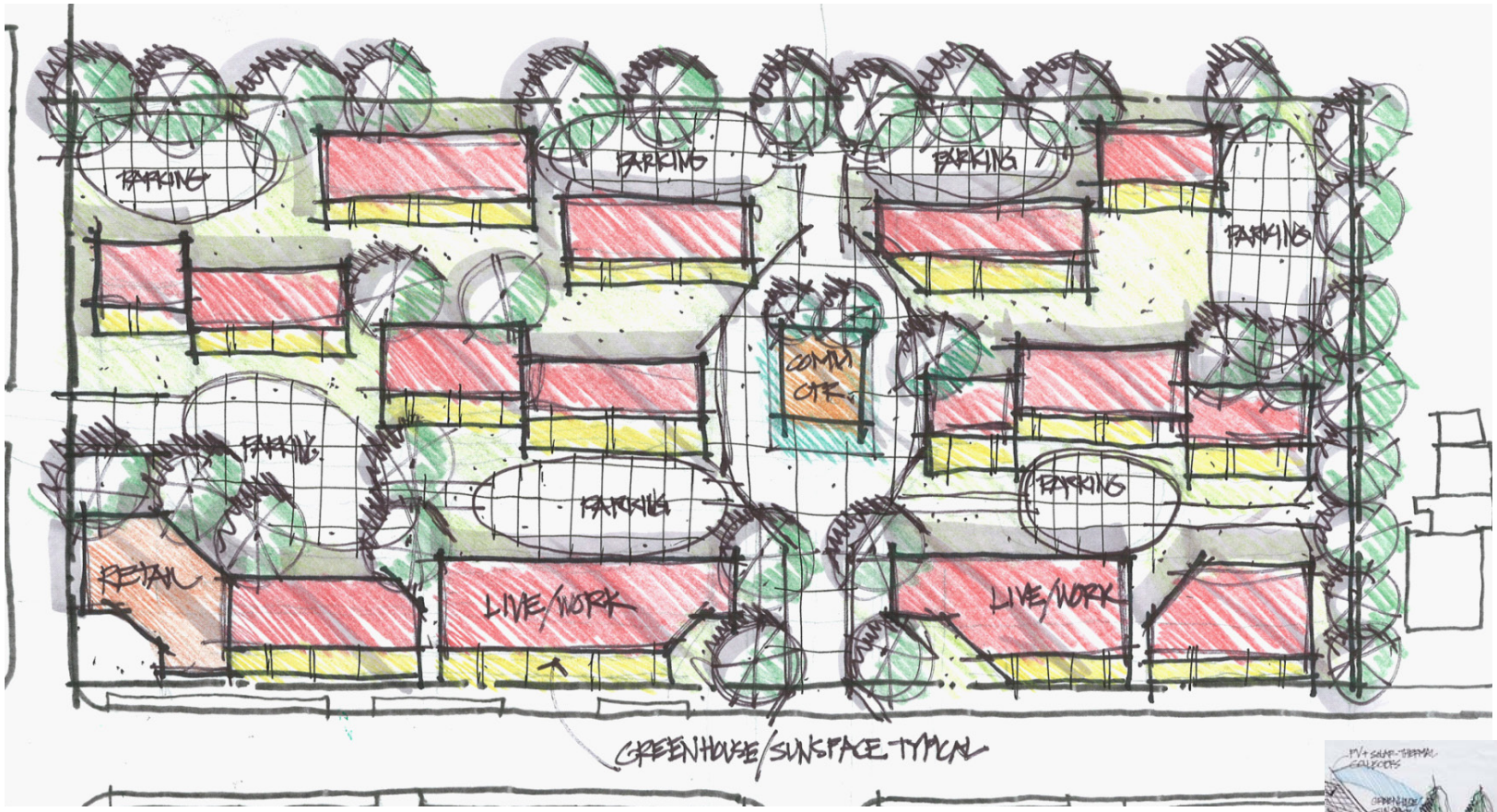


BENEFITS
Minimal roads within development
Water feature/tree in center provides visual focus and allows access
Buildings front Maryland

DRAWBACKS
Large surface parking
Low density

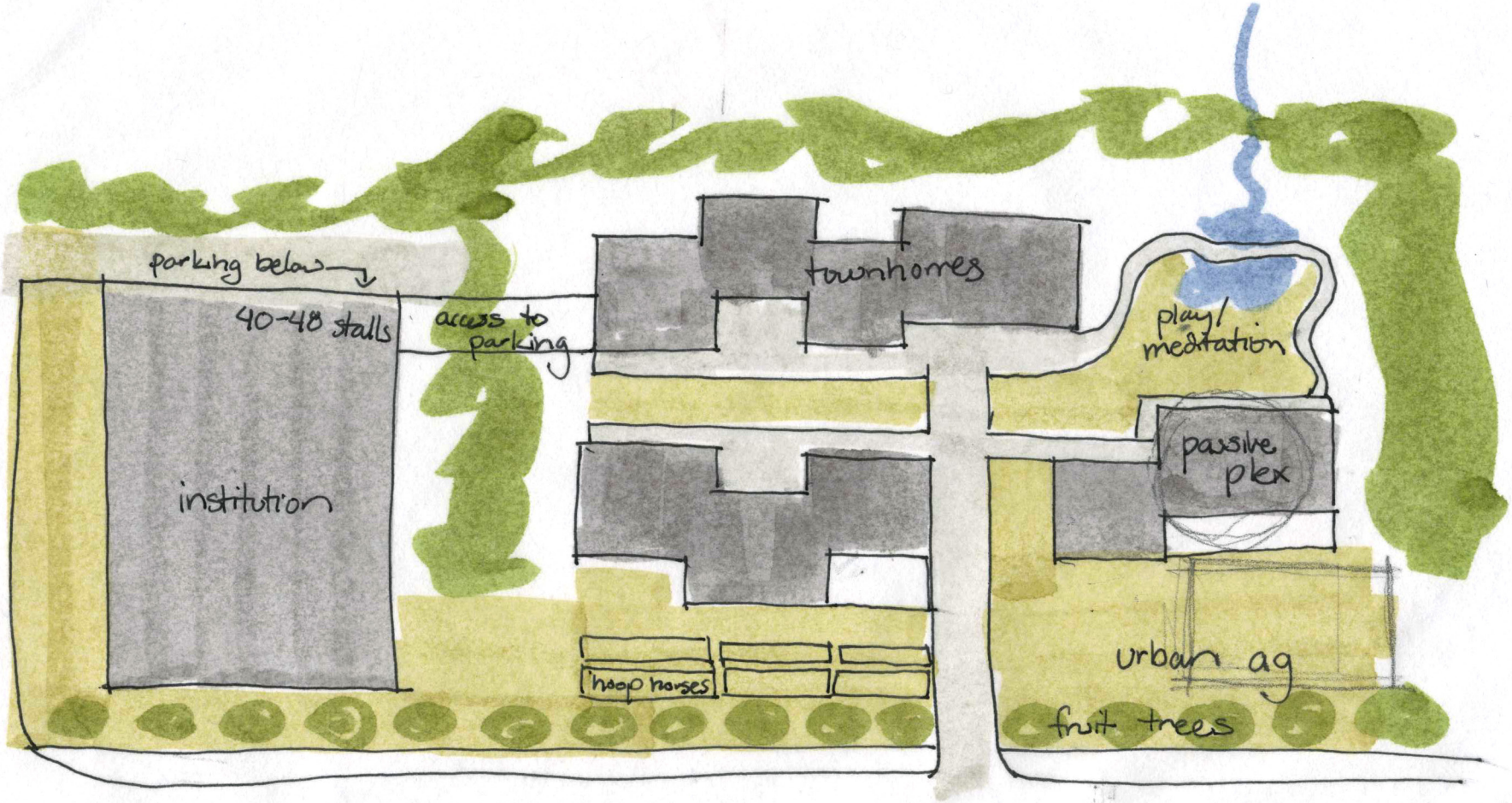
Greenlight Site Plan A



BENEFITS
Strong front on Maryland, yet open to road
Agriculture interspersed with dwelling in open courtyards
Low density throughout

DRAWBACKS
Many long driveways required
Drives & buildings near Willow Reserve
Requires two largest trees (cottonwood & maple) to be cut down

Greenlight Site Plan B

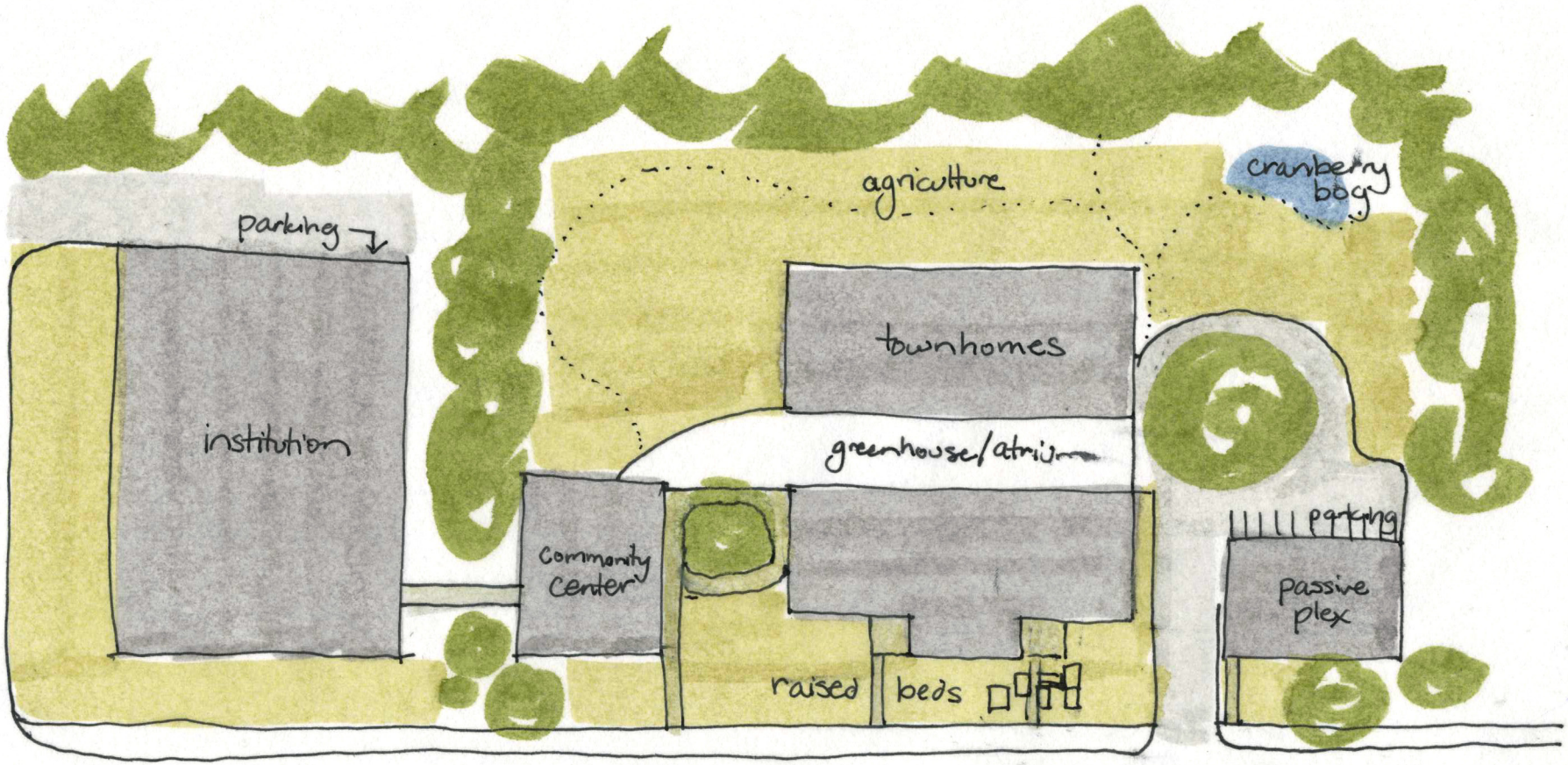


Footprint	(32.7%)	Square Footage	
Total	42049	Total	151903
Institution	21799	Institution	91153
Housing	20250	Housing	60750
Large-scale Ag	35500		

BENEFITS
Housing clusters form pedestrian courtyard sheltered from road, yet receiving adequate summer sun and open to community
Institution separated from housing by trees
Concealed access to underground parking (40-48 spots)

DRAWBACKS
Long driveways required
Drives & buildings near Willow Reserve
Requires two largest trees (cottonwood & maple) to be cut down

Site Plan 1A

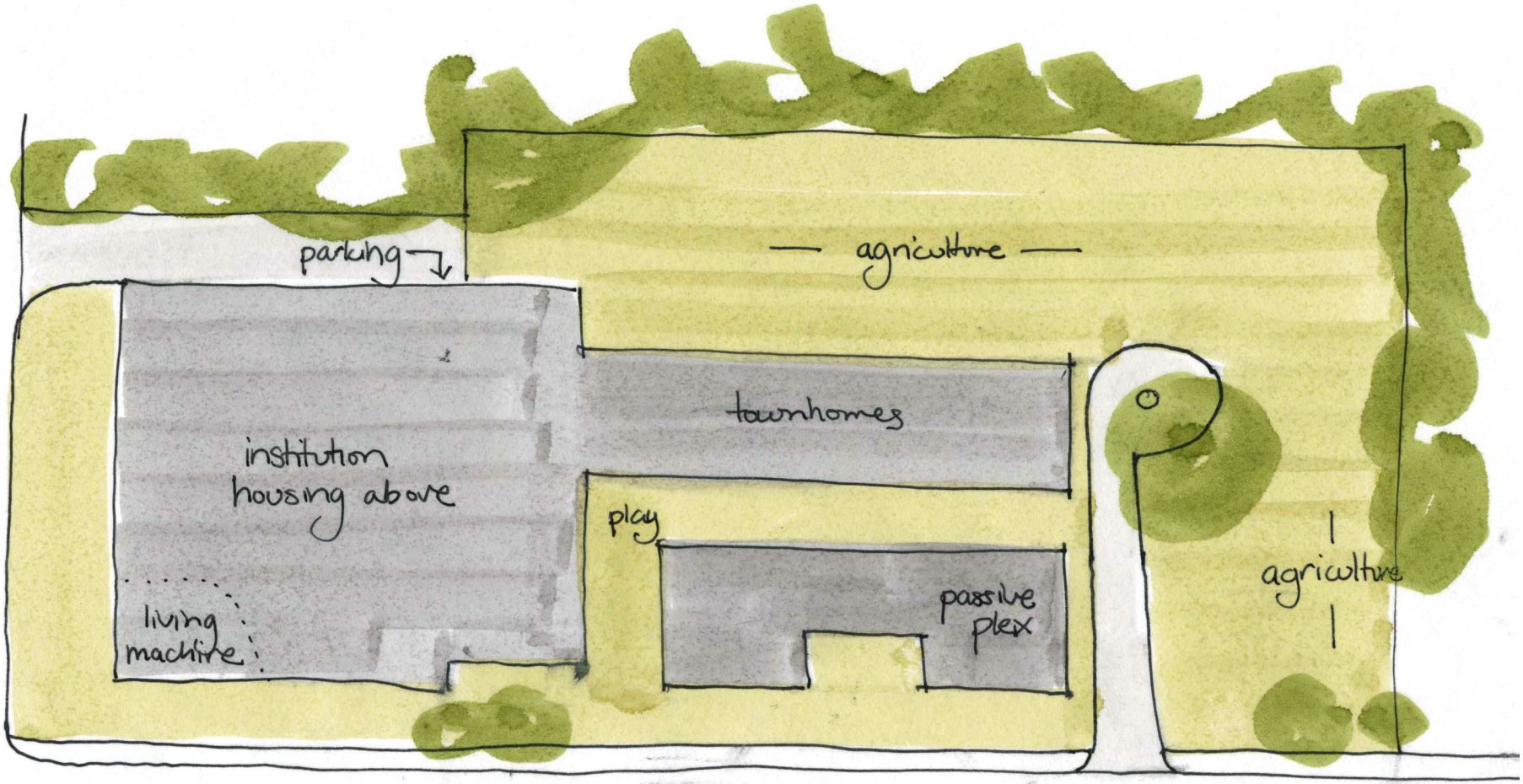


Footprint	(32.4%)	Square Footage	
Total	41734	Total	149090
Institution	21799	Institution	91153
Housing	19935	Housing	57937
Large-scale Ag	35000		

BENEFITS
Greenhouse/atrium at center of townhomes
Strong street front opens to allow access
Institution separated from housing by trees
Concealed access to underground parking (40-48 spots)

DRAWBACKS
Minimized space for agriculture- separated into smaller chunks
Large driveway on East

Site Plan 1B

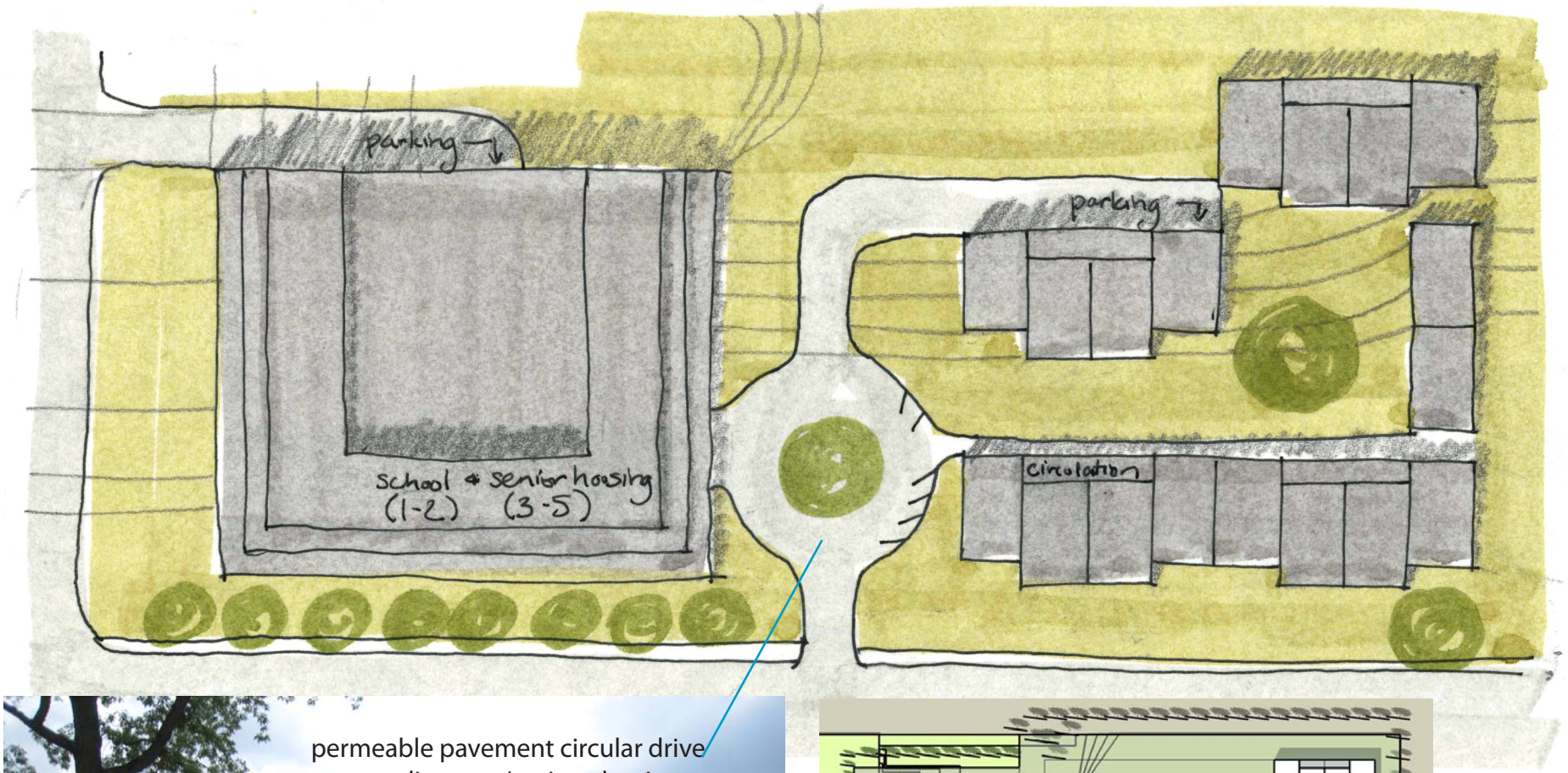


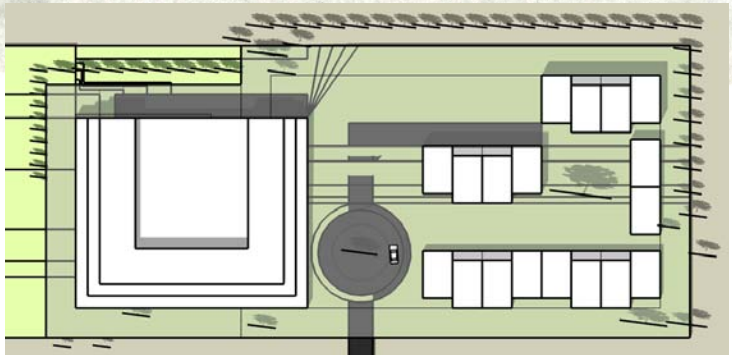
Footprint	(35.0%)	Square Footage	
Total	45036	Total	114355
Institution	28026	Institution	53382
Housing	17010	Housing	60973
Large-scale Ag	55000		

BENEFITS
Large unobstructed spaces left for agriculture
Connected building mass combines institution and dwelling
Passive Plex conceals large building mass
Concealed access to underground parking

DRAWBACKS
Building may appear overpowering to neighborhood/rest of site
Dissimilar building typologies in close proximity
Most original trees torn down

Site Plan 1C





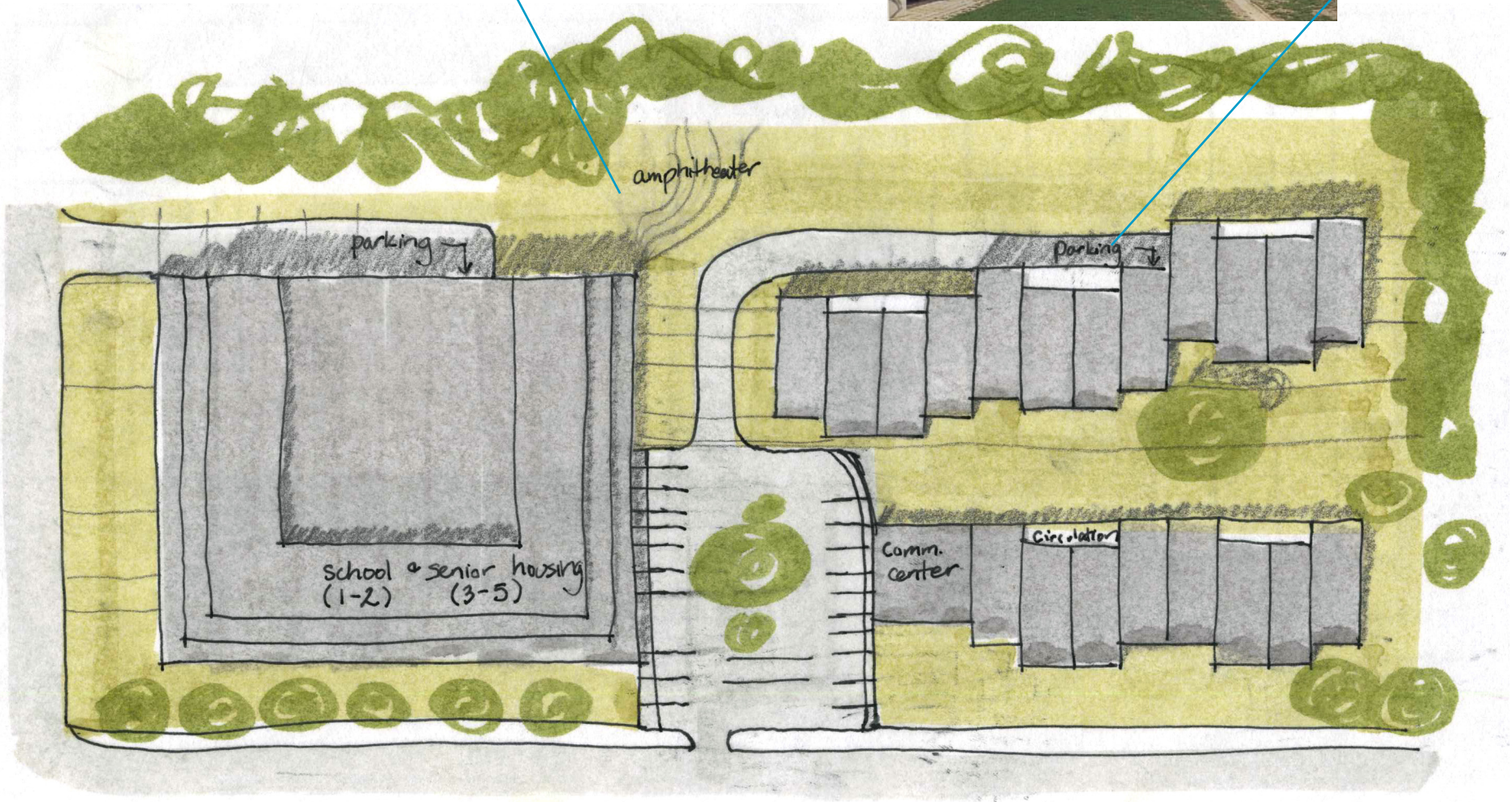
+ trees preserved and form center of two courtyards
+ agricultural space maximized
- housing minimized

Site Plan 2A

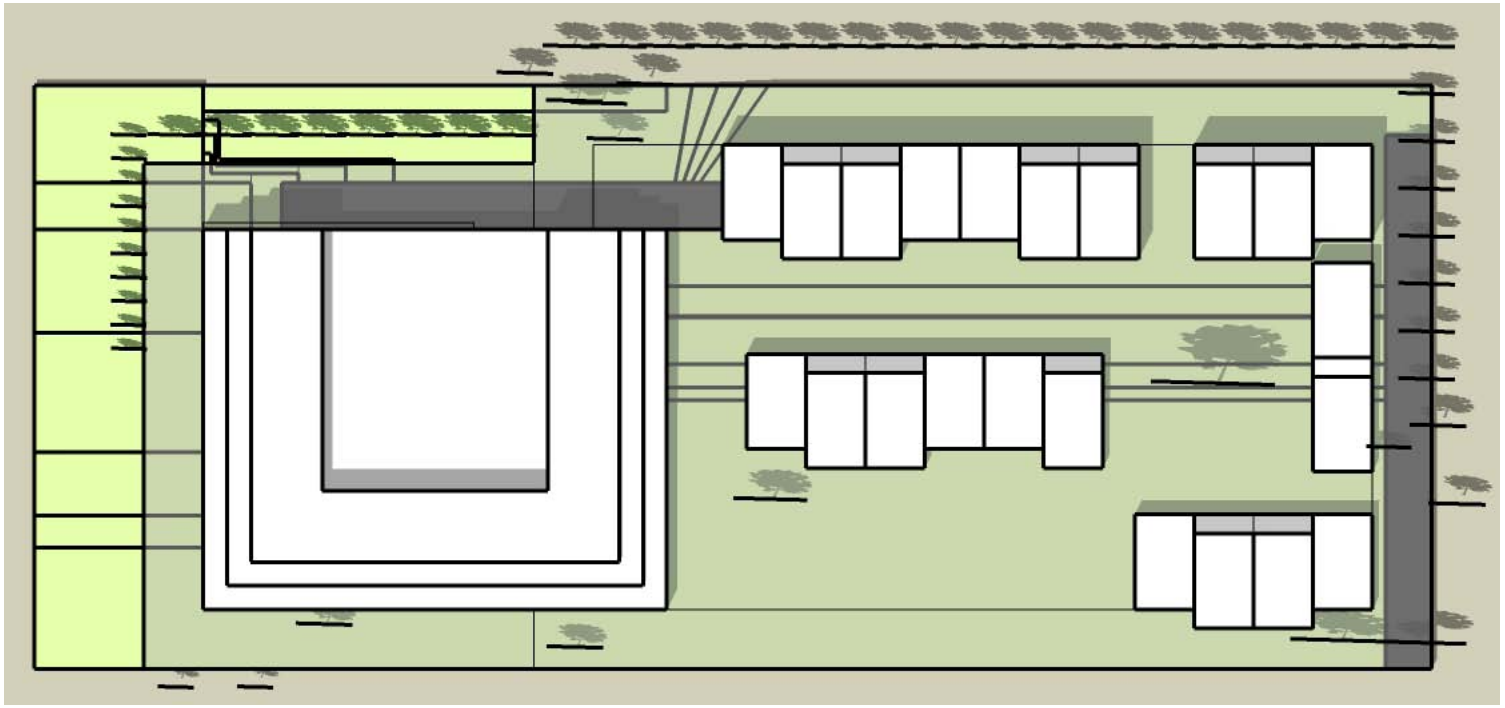
+ shared parking joins programs and could be used for play/farmers' markets
+ housing maximized
- parking at center of development (celebrating cars too much?)

amphitheater built into side of hill

parking could be sheltered but not inclosed (would this work with MN climate? these are passive standard apartments in Germany)



Site Plan 2B



Site Plan 2C

+ agriculture visible to community but framed by buildings
+ several distinct court-yards created which flow into one another
-limited access to Reserve (privacy increases with distance from street)

Site Plan 2D

same as plan A, but with circular drive instead of parking lot- more visually engaging and welcoming, but is too much function lost?